being able to divide themſelves ſo ſoon to follow them, ſome of them will have the good Fortune not to be purſued, or to eſcape if they are. But if the retreating *Army* is not above one Third weaker than that which purſues, and the *General* has Orders not to engage, he muſt then quit the worſt of his Baggage; and if he can leave his Cannon in a Place of Safety, only take ſome ſmall Pieces which will not retard his March, and then ſet forwards with the greateſt Secrecy. He muſt march Day and Night, and not halt any longer than is ſufficient to give Time to his Men and Horſes to recover their Strength; but if the Enemy comes up with him, he muſt march ſlower, and ſend Pioneers before him to mend the Ways, with ſuch Officers as are in Authority, careful and underſtanding, that the Work may be done with Expedition, the moſt neceſſary Thing in Retreats. If any Party be detached from the main Body to purſue him, he muſt charge in furiouſly, or endeavour to cut off by an Ambuſh, or ſend ſome Squadrons about to cut off their Retreat, while he attacks it in the Front.

Muſqueteers muſt be placed in all ſtrait Places to ſkirmiſh with the Enemy; and in Plains let the Army march in cloſe Order, and retire through the Plains or Covert-Ways, according as he is ſtronger or weaker than the Enemy in Horſe or Foot. He muſt endeavour to halt by Night or Day, on the Edge of ſome Defile after he has paſſed it; and if he has made a very long March, and believes the Enemy have left ſo many behind, that they cannot be ſo ſtrong as he, let him lay hold of that Opportunity to give them Battle; and if he marches through a Wood, he ſhall cauſe as many Trees as he can to be cut down a-croſs the Wood, for it will take up more Time to remove than to fell them.

But if the *Army* that retreats is ſtronger than that which purſues, at all Defiles thro' which it muſt paſs, the Troops of the Rear ſhould not be too far divided from the reſt, that they may be eaſily ſuccoured in Caſe they be attacked. If it muſt file off in a Wood, a great Number of Muſqueteers muſt be poſted on the Right and Left, 'till all the Horſe are paſt. The heavy Cannon and Baggage is to march in the Front, with only one or two Squadrons and ſome Muſqueteers, as well to diſappoint any Ambuſh, as to prevent the Baggage from falling into Confuſion. If the *General* ſuſpects that the Enemy will detach Parties from their *Army*, or ſend Troops from their Garriſons or Country, towards the Front of the *Army*, either to cut off the *Van* in ſome difficult Paſs, or to plunder the Baggage; he muſt detach ſuch Forces from his *Army*, as he ſhall think neceſſary to prevent theſe Inconveniencies, either ſecuring the Baggage or the Place through which he is to file off. In all Defiles he muſt cover himſelf with the Cannon as much as may be, lining the Edges of the Paſs with Field-Pieces, and with all his Cannon, if he perceives the Enemy will attack him when he is half through.

If he is in ſuch a Condition as to deſire to come to a Battle, he muſt endeavour to draw the Enemy to it, either by turning back upon them, when they have paſſed ſome dangerous Defile after him, or elſe by drawing up in Order of Battle, behind a Hill or Wood, with the greateſt Part of his Forces, and cauſing the Baggage and the reſt to hold on their March, ſo to take from the Enemy all Knowledge of his Ambuſh, or to fall upon their Flank, when they are advanced towards their Baggage.

All Orders of Battle for a Retreat differ according to the Diverſity of Circumſtances that occur; the uſual Method of retreating is in Columns, except a ſmall Body in the Rear. And in an Army of 15000 or 20,000 Men, it uſually conſiſts of eight or ten Squadrons, and two or three Battalions, which are to march in a Line in an open Country, only keeping two Squadrons behind to amuſe the Enemy. In an enclofed Country the Battalions and Squadrons muſt be intermix'd, and detached Muſqueteers muſt bring up the Rear. Secrecy in ſetting forwards, Diligence in marching, Care in mending the Ways, and Cunning in fighting, are all the Advantages in this Part of War; and a *General* who manages a Retreat, in the different Manners here preſcribed, is always commended and admired for his Prudence and Conduct. That of *Schulembourg* in *Poland*, before the victorious *Army* of the two Kings, *Charles* XII. of *Sweden*, and *Staniſlaus* of *Poland*, was commended by *Charles* as a Victory; *Schulembourg*, ſaid he to *Staniſlaus*, has conquered us this Day.

But as we ſuppoſe our *Army* to have gained a complete Victory, which has inſpired our Forces with new Courage, we'll not quit the Field 'till we have attempted ſomething farther; therefore we'll march to the Siege of the next Town of the Enemy, where they could rally and recruit their routed Forces; which the better to effect, we'll view the Ground round about it, eſpecially on that Side the Enemy may come, and we'll order Parties abroad to give Intelligence of their March; and according to the Information we receive, we'll either expect their coming, in an advantageous Poſt, or go to meet them, which laſt is the ſureſt Way; for if we wait for them in one certain Place, we give them an Opportunity of relieving the Town ſome other Way, which is not to be done, ſince we are not ſo weak, as to expect to fight to a great Diſadvantage, for if we were, we ought to ſecure ourſelves by a ſtrong Line of Circumvallation.

Therefore being determined to meet the Enemy, we'll view all the Way as far as poſſible, and having obſerved the advantageous Places, we'll draw up before them, which muſt be done according to the Nature and Situation of the Ground. If there be a River, a Moraſs or Wood, or a Hill on one Wing, we'll place almoſt all the Horſe on the other, and the Foot in the Wood, if it is not too cloſe, or along the Ridge of a Hill. If we are ſtronger in Horſe, and weaker in Foot than the Enemy, we'll endeavour to fight in an open Plain; and in Encloſures, if we are ſtronger in Foot than in Horſe. If the Enemy will not hazard a Battle, they will endeavour to ſteal Succours into the Town by Night, which is difficult to be obſtructed, if there be no Line of Circumvallation made, and it is dangerous to detach Forces ſufficient to inveſt the Town, leſt the Enemy take that Advantage to attack the *Army*.

When the Quarters are entrenched, and the Line of Circumvallation not made, they ſerve only to prevent a Surprize, and to gain Time for the Foot to join, in caſe the Enemy comes unexpected, or in caſe an *Army* much ſtronger than ours ſhould come to relieve the Town before we be informed of it; in which Caſe all the Forces muſt be brought into the ſtrongeſt Quarters, if we have not Time to retreat before, and then we muſt draw off in the Night.

The Enemy muſt be expected or avoided, according to the Strength of the Line of Circumvallation. The Order of Battle behind a Line is quite different from the others; for a third Part, or thereabouts, are poſted to man the Line, and ſome are to be poſted for the moſt Part in *Redans*, or Angles ſailant, they being the moſt conſiderable Places for Defence of the Line. The reſt of the Forces muſt be drawn up in two Lines, the firſt thirty Paces from the Entrenchment, and the ſecond one hundred Paces from the firſt Line; and we muſt intermix the Battalions and Squadrons. It would be convenient that every Squadron had four or five Files, ſomewhat detached from the reſt, to be ready to charge any that begin to paſs the Line, if we had not Numbers ſufficient to oblige the whole Squadron to charge them, unleſs we ſhould detach ſmall Parties of fifteen or twenty Men for this Purpoſe.

All the Forces muſt never be poſted to guard any one Part of the Line, unleſs we be thoroughly aſſured that the Enemy's Troops are in one Body, and have not detached any Number to attempt another Place. The Defence of a Camp that is intrenched is the ſame with that of a Circumvallation, and the chief Care is that the Enemy do not fortify themſelves within the Intrenchments; to prevent which, they muſt

muſt be continually charged as faſt as they enter, and not be allowed Time to draw up in Order of Battle.

A ſufficient Number of Workmen muſt be ready to repair the Line, when the Enemies have thrown it down, and are repulſed, leſt they make a freſh Attack; or elſe in Order to throw down the Line to ſally after them if they are much weakened, and diſcouraged. Many Cannon are of great Uſe for the Defence of the Lines, becauſe there's no coming to handy Strokes ſo ſoon as when a Battle is fought where there are no Intrenchments. The Cannon is to be planted in thoſe Parts which command moſt of the Plain, and in the *Redans*, from whence they ſweep the Length of the Intrenchment.

If the Enemy attempts to make us raiſe the Siege; and our Trenches are opened, and no Lines of Circumvallation drawn, which ſhould have been done, then if we are not much ſuperiour to them, we muſt draw off all our Men to bend our united Force againſt theirs; but if we are much ſtronger, we'll leave then as many Men as may ſecure the Trenches, and meet the Enemy with the Reſt; marching not too far, leſt they ſhould throw Succours into the Town, who, joining with the Garriſon, could gain our Trenches.

But perhaps we march to raiſe a Siege, and deſign to take the Advantage of the Circumvallation being not finiſhed, to fight the Enemy; then we muſt march directly up to the Place, having firſt ſent Parties to bring Advice whether they come to meet us, taking particular Care that they do not fight us when we are half paſſed a Defile, and that we do not attack them in an advantageous Poſt.—In ſuch a Caſe we muſt turn to the Right or Left, and march another Way to the Place.—We muſt not march ſo cloſe that they may attack our Flank or Rear, but keep at a due Diſtance, that if they quit their Poſt, they may find us in a Poſture to receive them.——If we have no Mind to fight, we'll keep ourſelves in an advantageous Poſt, and at Night detach two or three conſiderable Parties to relieve the Place, and order them to take the greateſt Compaſs we think fit, and while they are endeavouring to throw themſelves into the Place, we'll make a Shew of intending to fight, that the Enemies may not divide their Forces.

If our Parties ſhould happen to be defeated, and we obliged ſoon to retire either for Want of Proviſions, or for any other Reaſon, or the Circumvallation finiſhed before our Return, then we'll hazzard a Battle, if the Place be worth it.——To this Purpoſe we'll ſend a Party or two to alarm the Enemy in the Night, and oblige the Enemy to divide their Forces, then march with our Army the Way we think we are leaſt expected.——If the Enemies have taken up their Quarters and are not intrenched, we'll endeavour to ſurprize one of them, and throw in our Succours that Way; and ſo weakening their Army, we may be in a Condition to fight them.——But if their Quarters be intrenched, we'll endeavour to chop in between them, and throw in our Succours that Way.——If we are much their Superiors, then we'll attack one of their Quarters; or if they all get into one, and we have put Succours into the Place, we'll encamp between them and their Country to ſtarve them; or if they come out, to fight them in their Retreat.

If the Line of Circumvallation be finiſhed, and we deſign to force it, in Order to throw Succours into the Town, we muſt encamp as cloſe as we can, that is, out of Cannon-Shot, and at Night divide the *Army* into one main Body, and ſeveral ſmall ones, ſo to make two Attacks; but they muſt not be ſo far aſunder, that if the Enemy ſallies out upon one Body and beats it, the other cannot come to its Relief; and we'll march in the Night, that the Enemy may not diſcover our Deſign.

The propereſt Time for attacking is half an Hour before Day-break; for then the Enemy not being able to diſtinguiſh between a true and falſe Attack, will not know how to uſe their Cannon, and the Fire of their ſmall Arms will do leſs Execution by Night; and when we have gained ſome Advantage by the firſt Attack, the Day increaſing will let us ſee where to improve our Succeſs.——As the Iſſue of Battles fought by Night is more dubious than by Day, and *Armies* are often ſeized with a panick Fear, which cauſes them to run away; this is the propereſt Time to attack *Armies* ſtronger than ourſelves.——Beſides, an Attack in the Day expoſes our Men to the Shot of the Cannon and ſmall Arms, which are under Covert, and if we do not force the Line at firſt, we may have ſo many Men killed, that it may diſcourage the reſt of our Forces.

The Order obſerved in attacking of Lines, is to give Advice to the Town what Hour the Attack will be made, that they may ſecond it by a Sally; and to know which Way they can be more ſerviceable to us, whether by breaking through unexpectedly as far as the Line, or by throwing down ſome Part of it, or by ſeizing ſome Redoubts, if they are ſtrong enough to undertake it; or if not, by poſſeſſing themſelves of an advantageous Spot of Ground, as near the Line as may be, yet ſo that they may not be cut off from the Town; but take ſome Field-pieces along with them.——The Advantage conſiſts in the Garriſon being ſo far advanced, that they leave the Enemy leſs Ground to draw up in Order of Battle between them and the Circumvallation; and ſo if one Troop enters the Line, and the reſt are repulſed (which often happens) the Garriſon will receive thoſe who go to relieve them, who would otherwiſe be in Danger of being cut off between the Line and the Town.

It muſt alſo be known which Part of the Line is the weakeſt; as if the Ditch be narrower and ſhallower, and the Parapet lower than in other Parts, leſs flanked with *Redans* or Angles ſailant, and leſs defended by Forts.——If the Ground behind it be unfit for drawing up the Forces to defend it, as if there were Vineyards, Woods, and Moraſſes.—If it be ſo near the Place beſieged that the Cannon can reach it, and play upon the Troops poſted to defend it.—Or laſtly, if it be commanded by any riſing Ground, on which we can lodge ourſelves.——There is another Advantage to be ſought for, when we deſign to attack the Lines by Day, which is to find a Place that may bring us up cloſe to the Line under Covert.

The Weakneſs of Lines proceeding from the Fault of the *Ditch*, the *Parapets* and *Flanks*, and Inconveniency of the Ground within, where the Forces cannot be drawn up, may be advantageous to us by Night or Day; and when the Line is too near the Town, or commanded by a riſing Ground, we muſt not be too haſty in attacking, but rather ſtand ſtill in Battle, before the Places where thoſe Faults are; and if the Enemy do not poſt any great Number of Troops there, then force them: But if they do, then attack them not, but let them be deſtroyed by the Cannon of the Town, and by ours.

In attacking the Lines, ſeveral Platoons, each commanded by a Serjeant, muſt march before, who are to be followed by two or three hundred Men, each carrying a Faſcine and his Arms, who, when they have caſt their Faſcines into the Ditch, endeavour to mount the Line.——After this an hundred Men muſt go with Pick-axes and other Tools, to throw down the Line that the Horſe may enter; and in Caſe of a Repulſe, other Attacks may be made with Eaſe the ſame Way.——The Men muſt be ſuſtained by Battalions always firing while the others work.——Two or three thouſand Men may be employed in every Attack, and ordered to fall on near one another, or at a ſmall Diſtance, and the Horſe to be divided to ſuſtain them: And a ſtrong *Corps de Reſerve* is to ſtand ready out of Cannon ſhot, but the nearer the better, if a Place can be found under Covert.——The Battalions which ſuſtain that which falls on, muſt be directly in the Rear of it, but on the Right and Left, and at a greater Diſtance: By this Means they will ſee how thoſe who attack proceed, and the better judge what they are to do themſelves, and cannot be

be disordered by such as run away, or the wounded Men who retire.

It would be proper to send a Squadron to sustain them near at Hand, and the rest are to be kept just out of Musquet-shot, causing them to advance, as the Foot make themselves Masters of the Line.—— The Regiments which sustain should have some Tools, because if the Enemy in a Consternation quit any other Place than that which was attacked, those Regiments may possess themselves of it.

Note, That though we should defer speaking of Lines of *Circumvallation*, of *Redans* or *Angles Sailant*, and of Redoubts, till we come to our Treatise of *Fortifications*, under the Letter *F*; moreover as we have mentioned them here, for the better Satisfaction of the Reader, I think myself obliged to elucidate these Terms; therefore,—A Line of *Circumvallation*, from the *Latin*, *Circum*, and *Vallum*, Wall or Mound, is a Line or Trench with a Parapet, thrown up by the Besiegers encompassing all their Camp, to defend it against any *Army* that may attempt to relieve the Place.——A *Parapet* is a Defence or Skreen on the Extreme of the Line, to cover the Soldiers and the Cannon from the Enemy's Fire.——*Redans* are a Kind of Work indented in Form of the Teeth of a Saw, with *saliant* and *re-entring Angles*, to the End that one Part may flank or defend another.—A *Redoubt* is a small square Fort, without any Defence but in Front.—The Word is *French*, from the *Latin*, *Reductus*.

But perhaps after a Victory, or without a Victory, we enter the Enemy's Country, or to ravage it, or to put it under Contribution, or to hinder the Junction of an Army designed to rendezvous there, or to fight one already joined.

If to ravage the Country, we must divide our *Army* into several Bodies, but not so small as that either of them may be beaten.——If to take a Post, to lay it under Contribution, we must chuse one commodious for Forage, that has good Air, and so seated, that we may have Provisions from our own Country, in Case the Place where we are cannot furnish our Forces; and we must take Care to secure a Retreat, if the Enemy should come upon us with stronger Force; and it is safest to intrench.—If to hinder the Junction of an *Army*, we must hasten into our Quarters, to surprize those who shall not be quick enough to retire, and then pursue the rest as far as can be. —If to fight an *Army* already formed, we must be cautious, and know the Strength of it, and the Place where it lies, lest in our March we meet with it, in a disadvantageous Place.

When we enter an Enemy's Country, we must consider the Nature of the Rivers we pass; as whether a great Shower of Rain, or the Sun melting the Snows, may not prevent us from repassing.—Or if we would force any considerable Pass into it, as one on the Mountains, or over a River, or an Intrenchment, all depend on Expedition, especially in gaining Passes on Mountains, from whence it is not an easy Matter to drive those, who have once lodged themselves.

If the Enemy are there before us, and are not numerous, we must endeavour to surprize them; but if we fail herein, and are obliged to do it by open Force, we must strive to gain an Eminence above them, or if they are not very strong, and are shut up with Batteries, we must attack them with *Petards*, *Scaling-Ladders*, and *Hand granades*.—— If a Tower or Castle secures a Pass, we must use the *Petard*, or fix the *Miner* to it: And remember that in all difficult Places we must forecast to secure a Retreat; and if we leave a Pass behind us, to place a sufficient Guard there.

If we are to force a Pass upon a River, we must chuse a convenient Place for a Passage on our Side, and if there be any rising Ground, place our Cannon upon it, to prevent the Enemy's Troops from drawing up.—Having viewed the Place, we must make a shew of passing in several Places; and when our Cannon is planted, throw up a Parapet on the Bank of the River, about a thousand Fathoms in Length, placing Musqueteers behind it, then launch our Tinn Boats, and send over some Men, part Soldiers and part Workmen, to throw up a half Moon.—This being done, we are to send more to defend it, in Case we be attacked, and other Workmen to make another half Moon, on the Right, or on the Left of the first.—If we are not pressed by the Enemy while we are making the first half Moon, we may carry on a Horn-work, the Wings of it to be flanked by the first Parapet, and the Cannon lodged there.—But if the River be so broad that a Musquet cannot defend the Wings of the Horn-work, it must be defended by half-Moons made beyond the Water. In the mean Time we must labour hard at the Bridge, and when finished cause the Troops to pass, if the Enemy be not on the Spot; if they are, the Horn-work must be finished, that they may not fall upon the Troops as they pass.———When it is finished as strong as it shall be thought necessary, we must put as many Foot in it, as it will conveniently hold, and some Field Pieces; then the Cannon upon the Hill keeping the Enemy at a Distance; the Cavalry may also pass.———But yet this is not to be done, but when their Army is much weaker than our own, for if they were as strong as we, then when half our Men were over they would fall in with them, and our Cannon or Musquets would do them no Harm; and though they could not force our Intrenchment, yet they would cut off all without it.——Therefore if their Army be near as strong as ours, we must finish the Horn-work, and at the same Time making another Bridge and another Horn-work, at some Distance from the first, draw a Line from one to the other. The last and surest Way is to secure a Pass at some Distance from the Place where we lie, that the Enemy may not presently have Notice of it; and to keep Part of our Forces, as long as we can before them, to give them the least Occasion to suspect we have detached any Troops.

If there be any Brook, Morass, Ditch, hollow Way, rising Ground, or other difficult Pass, or any Eminence at Hand, on which the Enemy may conveniently lodge themselves, and plant Cannon on the other Side the River, where we design to pass; it will be requisite to make some Redoubts on the Passes, if the Enemy are not there already; for if they are much weaker than we, they may come and intrench themselves there, and by securing the second Pass, make the first useless.

But perhaps we are to guard such a Pass, therefore we must view all Places along the River which are fit for that Purpose, and throw up Forts and Redoubts before them, if we can, and cause the Country People to be upon Guard, if we are afraid to divide our *Army* too much, that we may have Notice of the Approach of the Enemy, and be ready to receive them, and by our Spies and other Means get Intelligence when they make a Detachment to surprise another Pass. If we believe that a Part of our *Army* can easily defend the Passes, we may divide the Remainder into as many Parts as we shall think fit, to secure the other Passes from Surprize; but if our *Army* is so far inferior to the Enemy, that they despise it, and will pass by main Force, we must make the best of them according to our Circumstances.

If they draw up their Field-Pieces on the Edge of the Water, and have planted their heavy Cannon on higher Ground, determined to pass, without any Entrenchment, under the Fire of their Cannon and small Arms, which they suppose will keep us at a Distance; then if we have not an advantageous Place to plant our Cannon, we must post ourselves a Musket-shot from their Passage, either above or below it, that so making an Entrenchment, to cover us from their Artil-

Artillery, we may fire upon the Paſs without being expoſed. If there are any Hedges or Trees, we ſhould take the Advantage of that Covert, for it is dangerous to lodge Cannon in the Sight of great Batteries. If there be a hollow Way, Ditch, Ridge of Ground, or Hedge, we'll lodge as many Foot as we can there, and ſtrengthen our Lodgment the beſt we can. Yet if all our Efforts cannot prevent the Enemy from paſſing, as ſoon as a Part which is weaker than our *Army* is over, we'll ruſh in upon them, that in the Confuſion the Remainder on the other Side may not fire upon us, leſt they kill their own Men. If they make a Parapet on the Edge of the Water on their Side, and detach ſome Men to make a Half-moon, and their Bridge, and our Cannon and ſmall Shot cannot hinder them, then if the Place be convenient for Horſe, we muſt ſend ſome ſmall Parties, ſtronger than thoſe that are paſs'd; for if we ſend great Bodies, they will receive more Damage from the Enemies beyond the Water than we can receive by thoſe that are paſs'd.

If there be any Likelihood of carrying the Half-moon the Enemy have made at the Paſs, we muſt attack it with Vigour, and if we are repulſed, endeavour then to prevent their throwing up other Works, by poſting our Cannon and ſmall Shot advantageouſly for that Purpoſe. But if they have got a good ſafe Half-Moon, and are not over-haſty, it will be difficult to obſtruct their Paſſage; becauſe their Workmen whom they ſend to make other Intrenchments, will retire to the Ditch of the Half-moon, if we preſs upon them, and they that ſuſtain them will force us with their Volleys, and the Aſſiſtance of thoſe beyond the Water to retire, and then the Men will return to their Work; and as often as we attack them they will kill more of our Men than we can of theirs. However though theſe little Attacks coſt us ſome Men, yet if by that Means we can retard the Work 'till Night, it will be a great Advantage to us; for then being out of Sight of their Fire, we may make Lodgments for Muſqueteers, and raiſe Batteries as near their Works as poſſible, ſo that they who are lodged in them, will, by their Fire in the Morning, hinder the Enemies from extending their Works; and in Order to prevent their working by Night, we muſt make frequent Sallies, as often as they go about it, which will not be very dangerous, or keep a continual Firing from our ſmall Arms, charged with Partridge Shot; but if we cannot hinder their Paſſing, it will be eaſier to retire by Night than by Day. If we find the Paſs well ſecured with Works, then if there be a Moraſs, Ditch, or Ridge, or any other advantageous Ground, we'll entrench ourſelves upon the Ridges of it, to obſtruct their ſecond Paſſage.

When both Armies have a Deſign to poſſeſs themſelves of an advantageous Poſt, it often occaſions a Battle. The Precaution to be uſed, in that Caſe, is to ſend out Scouts towards them, and not to march without a good Number of ſmall Parties out before us, to prevent meeting the Enemy in a dangerous Place. A ſtrong Detachment is to be ſent from the *Army* to take Poſſeſſion of the Poſt, and expect the Enemy there, provided our Detachment be ſtrong enough, to maintain it 'till the whole *Army* come up. If we know that the Enemy muſt paſs a difficult Defile, we muſt ſend ſome Parties thither to ſpoil the Ways, and to ſkirmiſh with them.

When we find ourſelves inveſted by an *Army* ſtronger than ours, whereby our Proviſions are cut off, and no Hope of getting any, without hazarding a Battle, we muſt then make an Attempt, either in Order, to get clear out of our Poſt, or elſe to bring in the Convoy; though it has happened ſometimes, that by a too great Confidence, or rather Preſumption, in a *General*, an *Army* has been ſo well hedged in, that it was impoſſible to ſally out, without it being expoſed to be cut to Pieces, as it happened to the *Czar*, *Peter* I. upon the *Pruth*, where his whole *Army* muſt have periſhed for Want of Proviſions, or fallen by the Swords of the *Turks*, if the *Czarina*, *Catherine*, his Wife, had not found the Secret of amuſing the *Grand Vizir* with advantageous Propoſals, to give Time to the *Czar* to extricate himſelf out of that great Dilemma, as he did, to the Diſappointment of *Charles* XII. King of *Sweden*, who came one Day too late to make the Advantage he expected, from the Diſtreſs of his moſt formidable Enemy; which Diſappointment ſo enraged the Hero, that he could not help reproaching the *Grand Vizir* with Perfidy and Cowardice.

If we deſign to bring in the Convoy, we muſt order it to come with the greateſt Secreſy, through ſuch a Road, as we'll judge more proper for us to meet it, without hazarding a diſadvantageous Battle; to effect which we muſt march out with all our Forces; for though we ventured but little before the Coming of the Convoy, yet the Loſs of it would loſe all, if our Safety depended on its coming ſafe. But if we think there is as much Difficulty to bring in the Convoy ſafe as in leaving our Poſt; or though it ſhould come ſafe it would ſubſiſt our *Army* but for a few Days, and that there might be the ſame Hazard ſoon after in bringing another, ſo that the Delay would be no Advantage to us, then it would be more prudent to make an Effort at firſt than to ſtay any longer, becauſe an *Army* always declines, and for the moſt Part loſes Courage and Strength.

Note, That a CONVOY, in this Place, is a Body of Forces ſent to guard a Supply of Proviſions, Arms, or Ammunition, going to a Camp, to an *Army*, or to a beſieged Town. There are two Sorts of *Convoy*, *viz.* a *ſmall* and a *Grand Convoy*; a *ſmall Convoy* conſiſts only in a few Waggons, or Horſes loaded, with Ammunition or Proviſions, and is eſcorted with a ſmall Detachment of Infantry. A *Grand Convoy* conſiſts of a very conſiderable Number of Waggons and Horſes loaded with Ammunition, Proviſions, and often with Money for the Payment of the *Army*, accompanied ſometimes with a Train of Artillery, and eſcorted with ſtrong Detachments of both Cavalry, and Infantry, the Cavalry on the Right and Left, and the Infantry in the Front and on the Rear.

In order to force our Way, we muſt either leave our Baggage, in the Place we quit, with a Guard; or if the Place cannot be defended without leaving a conſiderable Part of the *Army*, take all with us, for Fear of weakening ourſelves, and if we apprehend that our Baggage may incumber us, and hinder the Retreat we hope to make without it, we muſt ſave the beſt, and burn the reſt. Having firſt viewed the eaſieſt Way, we muſt ſet forward towards the Evening, and at the ſame Time ſend Parties to alarm the Enemy in ſeveral other Places, that they may be doubtful which Way we draw off. If we carry our Baggage with us, then we muſt keep between it and the Enemy, that is, when the Enemy is in the Rear, and the Baggage before us; and on the Left if they are on the Right; and ſo on the Right if they are on the Left. If the Enemy be before us, we muſt march on fighting courageouſly, and the ſame if they attack us briſkly in the Rear, or on the Flank; but if they come on but ſlowly, to retard us 'till all their Forces come up, then we muſt not ſtop at all, but defend ourſelves, retreating, never loſing Time to ſuſtain the Troops that are attacked, though ſome of them be loſt: Nay, it is ſometimes abſolutely neceſſary to loſe a ſmall Part to ſave a greater; but this Reſolution is never to be taken unleſs the greateſt Extremity compels us to it.

When two Armies are to be brought together, and the Enemy lies between them to hinder the Junction, we muſt appoint the *Rendezvous* upon the ſame Spot, and at the ſame Hour, on the Right, or on the Left of the Enemy; that ſo we may endeavour to join before they have got Intelligence of our March: Or if there be no paſſing without attacking them in their Poſt, then both muſt march and fall on at the

ſame Time. But if we can find Means of joining elſewhere, and there is a River or *Defile* to paſs, before the one can come at the other, then the *Army* that is not to paſs muſt be there firſt, to expect the other, and throw up ſome Intrenchments expeditiously, to lodge Muſqueteers in them to ſecure the Paſs, in Caſe the Enemy ſhould come, and fight the other *Army* ſeparately from ours; and in this Caſe we muſt paſs to relieve it. If the Enemy march to meet one of our *Armies*, it muſt avoid a Battle, until the other is come up, which may be effected by ſecuring an advantageous Poſt.

If it happens that a General is drawn in to give Battle by an Army which comes to beſiege a Place which he has newly taken, and before he has decamped from before it; if he will avoid fighting, and prevent the Place being beſieged again, he muſt furniſh it as expeditiouſly as he can with Ammunition and Proviſions, repair the Breaches, and add what Fortifications he thinks fit; and though his Convoy be not quite ready, or ſo compleat as he could wiſh, yet if he apprehend that the Enemy may come on before its Arrival, he muſt haſten it away in the Condition it is, and ſend back immediately for the reſt. When he is Maſter of the Place, he muſt keep only that Part of the Circumvallation which is moſt advantageous, joining it to the Town with an Intrenchment, that his *Army* may not be too far divided, and then throw down all the reſt.

When the Enemy comes to beſiege the Place, if we have almoſt put it into the Poſture we deſire, we muſt place there all the Proviſions and Ammunition we have for the Army, and retire into our own Country, leaving ſuch a Number of Forces as we judge requiſite for its Defence; taking Care however, not to leave ourſelves ſo bare of Proviſions, that the Enemy may take an Advantage of it, if they purſue us, and that they may not hinder our coming to the Place where we can have a Supply before what we carry with us be ſpent.

If the Enemy encamp between us and our Country, and we are not in a Condition to give them Battle, we muſt continue in our Camp, provided we have Proviſions enough to ſupport our Army, while we ſtay for conſiderable Succours. If we will not ſtay, and have Proviſions enough in the Place, we muſt take Care that our Retreat be as little known to the Enemy as we can, leaving our heavy Cannon in the Town, if we have no Time to ſend it away before us. If the Place be not ſufficiently provided, and we have Hope of Doing it, we muſt ſtay in our Camp to prevent the Enemy from forming the Siege; then cauſe our Convoy to come with as much Secreſy as poſſible, and ſend out Parties to meet them, ſome one Way and ſome another. In this Caſe we muſt conſider well which is of the greateſt Importance, the *Army* or the Place, and hazard the leaſt to ſecure the moſt.

When a General is to croſs an Enemy's Country, to relieve a Town, he muſt march with all poſſible Expedition, by way of Surprize, carrying nothing with him that is heavy, though there is ſometimes a Neceſſity of carrying heavy Cannon, as where there is a Caſtle or Town in the Way, through which he muſt unavoidably paſs.

If we would prevent the *Army* of the Enemy croſſing our Country, we muſt endeavour to cut it off in the Van at ſome Paſs, or fall upon its Rear, when half paſſed ſome *Defile*, giving it a Check by this Means, till the Country is in Arms, and all our Forces are joined: And we muſt endeavour as much as poſſible to avoid coming to a Battle, unleſs we have a great Advantage, becauſe by fighting in our own Country, the Loſs of one Battle may loſe all.

The Judgment, Prudence, and Conduct of a *General*, are alſo evidenced in the Surprize of an *Army*, or of Quarters. To ſurprize an *Army*, he muſt underſtand the Situation of the Camp, whether it is intrenched or not; its Strength in Horſe, Foot, and Cannon; how poſted; the Manner of the Encampment; what Guard is kept within and without; where the Guards, Centinels, and Vedets are poſted, and Care muſt be taken to avoid or ſurprize them. As ſoon as the Enemy has taken the Alarm, he muſt fall on with the greateſt Fury imaginable, that they may not have Time to form themſelves. If the Camp is intrenched, there muſt be carried Faſcines to fill up the Ditches, Pont-volans, Hand-Granades, and Hatchets.

Note, That FASCINES are ſmall Branches of Trees, or Bavins bound up in Bundles, which being mixed with Earth, ſerve to fill up Ditches, to ſcreen the Men, make the Parapets of Trenches, *&c.* Some of them are dipt in melted Pitch or Tar, and being ſet on fire, ſerve to burn the Enemies Lodgments or other Works. A pitched *Faſcine* is a Foot and a Half about; a *Faſcine* for Defence, two or three Foot. *Pont-volans*, or *Flying Bridge*, is a Kind of Bridge made of two ſmall Bridges laid one over another, and ſo contrived by Means of Cords and Pullies placed along the Sides of the under Bridge, that the upper may be puſh'd forwards, till it join the Place where it is deſigned to be fixed: The whole Length of both not to be above five Fathom, leſt they ſhould break with the Weight of the Men.

If he will ſurprize any particular Quarters of Horſe or Foot, if they are in a Place that is encloſed, he muſt uſe the ſame Method practiſed to ſurprize Garriſons, but if in an open Place, he muſt act according to their Strength, Guard, and Situation.

In order to break a Bridge which is advantageous to the Enemy, we muſt ſtrive to make ourſelves Maſters of one or both Ends, if they are not well fortified. If we dare not attempt the Lodgments the Enemies have made, we are to endeavour to burn the Bridge with Fireſhips, if it be a Bridge of Boats, or ſend ſome good Swimmers to cut the Ropes, or drive down a ſtrong Veſſel, heavy laden, to break them. If it be a wooden Bridge upon Piles, Men may be ſent in cover'd Boats to ſaw them, or elſe to daub them with Pitch and other combuſtible Matter, and then ſet Fire to it. We may alſo build a ſmall Body of Stone-work upon Boats, in the midſt whereof there ſhall be a Mine, loaded at Top with the largeſt Stones we can get, and over that a Piece of Timber to bear under the upper Part of the Bridge, or upon the Piles, and ſo open a Trunk to give Fire to the Mine, which ſhall ſpring while the Boats are under the Bridge. If we cannot make ſure of the Trunk for firing, a good Swimmer may carry a Boat, and tie or hook it to one of the main Pillars, and having ſet Fire to a *Sauciſſe*, ſwim away as faſt as he can. The Boats which have the Mines, may be conducted by other Boats; and ſo the Men in them, having faſtened the Boats that have the Mines, and giving Fire, may get off without Danger.

We would not ſend our *Army* into Quarters, before having beſieged a Town in Form, were we not to conſider, that Sieges and Manner of Beſieging belong properly to Fortification, and conſequently is to be included in our Treatiſe on that Subject, under the Letter *F*. Therefore we'll conclude this with ſome general Remarks on *Armies*.

The Author of the *Conſiderations ſur les Cauſes de la Grandeur des Romains*, c. 3. p. 24. is of Opinion, that a Prince with a Million of Subjects, cannot keep an *Army* of 10000 Men, without ruining himſelf. It was otherwiſe, ſay they, in the antient Republicks: The Proportion of Soldiers to the reſt of the People, which is now about one to an Hundred, might then be as about one to eight. The Reaſon ſeems owing to equal Partition of Lands which the antient Founders of Commonwealths made among their Subjects; ſo that every Man had a conſiderable Property to defend, and Means to defend it with. Whereas amongſt us the Lands and Riches of

of a Nation being ſhared among a few, the reſt have no Way of ſubſiſting, but by Trades, Arts, and the like; and have neither any free Property to defend, no Means to enable them to go to War in defence of it, without ſtarving their Families. A large Part of our People are either Artizans or Servants, and ſo only miniſter to the Luxury and Effeminacy of the Great. While the Equality of Land ſubſiſted, *Rome*, though only a little State, being refuſed the Succours which the *Latins* were obliged to furniſh after the taking of the City, in the Conſulate of *Camillus*, preſently raiſed ten Legions within their own Walls: Which was more, *Livy* aſſures us, than they were able to do in his Time, though Maſters of the greateſt Part of the World. A full Proof, adds the Hiſtorian, we are not grown ſtronger; and that what ſwells our City, is only Luxury, and the Means and Effects of it.

A LEGION was a Kind of Regiment, or Body of Forces, of a Number whereof the *Roman* Armies were chiefly compoſed. The Number of Soldiers and Officers whereof the *Legion* was compoſed, was different at different Times, but it is impoſſible to determine the preciſe Time and Manner of their Alteration. In the Time of *Romulus* each *Legion* contained 3000 Foot, and 300 Equites or Horſe; theſe were divided into three Bodies, which made as many Orders of Battle. Each Order conſiſted of ten Companies or Manipules, ranged at ſome Diſtance from each other, though in the ſame Front. Each Body had two general Officers to command it, called *Tribunes*, and each Manipule two *Centurions*.

The TRIBUNES were in the *Roman Armies*, much the ſame with our Colonels, or the *French Meſtre de Camp*. There was ſome Diſtinction of the *Tribunes*, into *Laticlavii*, and *Auguſticlavii*. The *Laticlavii*, were thus denominated, from their Garment, which was a Kind of Tunick or long Coat, faced with one or two Slips of Purple, applied lengthwiſe to the two Sides of the Tunick. In the *Latus clavus*, theſe Slips were pretty broad, and in the *Auguſtus clavus*, narrower. There were Buttons ſet on the *Latus clavus*, which appeared like the Heads of large Nails; whence ſome think it took its Name. There was no other Difference betwixt the *Latus clavus*, and *Auguſtus clavus*, but in the Broadneſs of the Slips of Purple.

A CENTURION was an Officer of Infantry who commanded a *Century*, or hundred Men. The firſt Centurion of the firſt Cohort of each *Legion*, was called *Primipilus*, *Primopilus*, or *Primipili Centurio*, ſometimes *Primus Centurio*, he was not under the Command of any Tribune, as all the reſt were; and had four *Centuries* under his Direction. He guarded the Standard and the Eagle of the *Legion*.

Under the *Conſuls* the *Legion* conſiſted of 4000 Men, who made four Bodies commanded by a Conſul, or one of his Lieutenants; and each Legion had its Share of Cavalry, which was from two to three hundred Horſe. Afterwards in the Time of *Marcus*, theſe four Diviſions of the *Legions* were united into one, and augmented; and *Cohorts* were appointed from five to ſix hundred Men, each under the Command of a Tribune. Each *Cohort* conſiſted of three Companies or Manipules, each Manipule of two Centuries; and the *Legion* was divided into ten *Cohorts*, who made as many diſtinct Battalions, diſpoſed in three Lines; ſo that the *Legion* then conſiſted of five or ſix thouſand Men.

Iſidore tells us, that the *Legion* conſiſted of ſix thouſand Men, divided into ſixty *Centuries*, thirty *Manipules*, twelve *Cohorts*, and two hundred *Troops*. According to the *French* Academy, the *Legion* conſiſted of ſix thouſand Foot, and ſeven hundred and twenty-five Horſe.

The *Legions* were by far the moſt conſiderable Part of the *Roman Army*, their Number in the Time of *Auguſtus*, were thirty three; and were compoſed wholly of *Roman* Citizens. The *Allies* formed a Body of auxiliary Forces.

When the *Army* was ranged in Order of Battle, the *Cohorts*, or Battalions were diſpoſed in the following Manner. The firſt Cohort took up the Right of the firſt Line, as the Companies of Grenadiers do in our Regiments; the reſt followed in their natural Order; ſo that the third was in the Center of the firſt Line of the Legion, and the fifth on the Left. The ſecond between the firſt and third; and the fourth between the third and fifth. The five remaining Cohorts formed a ſecond Line in their natural Order; thus the ſixth was behind the firſt, and ſo of the reſt.

The firſt, third, and fifth Cohorts were eſteemed the beſt, at leaſt it appear'd ſo from the Poſt they took up, which were looked on by the *Romans* as the moſt important.

The *Cohorts*, called *Pretorian*, from their Place or Station, in the Palace called *Prætorium*, were the Soldiers of the Emperor's Guards. Their Inſtitution was owing to *Scipio Africanus*, who firſt eſtabliſhed a Company of the braveſt Men in his *Army*, pick'd out for the Purpoſe, to be his Guard, and never to ſtir from his Side in Battle. *Dion* tells us, that their Number was at length increaſed to ten thouſand. They were commanded by an Officer, created by *Auguſtus*, called *Præfectus Prætorii*, the Prefect of the Pretory or Palace.

The STANDARD bore by the *Legions* was various. At firſt a Wolf, in Honour of that which ſuckled *Romulus*; afterwards a Hog, by Reaſon, ſays *Feſtus*, War is only undertaken with a View to Peace, which was concluded by Sacrificing a Hog. Sometimes they bore the *Minotaur*, to remind their General that their Deſigns were to be kept ſecret and inacceſſible as the *Minotaur* in the Labyrinth. They alſo bore a Horſe, a Boar, *&c.* *Pliny* tells us, that *Marius* was the firſt who changed all thoſe *Standards* into Eagles.

The ARMS of the antient *Roman Armies*, were a Launce or Javelin, a Sword and a ſmall Argian Buckler, which *Romulus*, during his Wars with the *Sabines*, a bold and warlike Nation, changed into a broad Buckler; and what contributed moſt to render the *Romans* Maſters of the World, was, that having ſucceſſively warred againſt all Nations, they renounced their own Methods, Arms, *&c.* whenever they met with better.

The *Armies* of the Grand Signior conſiſt chiefly of *Janizaries*, *Spahis*, and *Timariots*.

The JANIZARIES, reputed the Grand Signior's Foot Guards, are the beſt Infantry in the *Turkiſh Armies*; firſt inſtituted by *Amurath* I. called the Conqueror, who chuſing out one fifth Part of the Chriſtian Priſoners he had taken from the *Greeks*, and inſtructing them in the Diſcipline of War, and the Doctrine of their Religion, he ſent them to *Hagi Bektaſche* (a Perſon whoſe pretended Piety rendered him much revered among the *Turks*) to the End that he might confer his Bleſſing on them, and at the ſame Time give them ſome Marks to diſtinguiſh them from the reſt of the Troops. *Bektaſche*, after bleſſing them in his Manner, cut off one of the Sleeves of his Fur Gown, and put it on the Head of the Leader of this new Militia; from which Time, *viz.* the Year of Chriſt 1361, they have retained the Name of *Jenitcheri*, and the Fur Cap.

As in the *Turkiſh Armies* the *European* Troops are diſtinguiſhed from thoſe of *Aſia*; the *Janizaries* are alſo diſtinguiſhed into *Janizaries* of *Conſtantinople* and of *Damaſcus*. Their Dreſs conſiſts of a *Dolyman*, or long Gown with ſhort Sleeves, which is given them annually by the Grand Signior, on the firſt Day of *Ramazan*. They wear no Turban, but in lieu thereof a Kind of Cap which they call *Zarcola*, and a long Hood of the ſame Stuff, hanging on their Shoulders. On ſolemn Days they are adorned with Feathers, which are ſtuck in a little Caſe in the Forepart of the Bonnet.

Their Arms in *Europe*, in a Time of War, are a Sabre, a Carabine, or Muſquet, and a Cartouch-Box hanging on the left Side. At *Conſtantinople*, in a Time

Time of Peace, they wear only a long Staff in their Hand. In *Aſia*, where Powder and Fire-Arms are leſs common, they wear a Bow and Arrow, with a Poniard, which they call *Haniare*.

The *Janizaries* were heretofore a Body, formidable even to their Maſters, the *Grand Seigniors*: *Oſman* they firſt ſtripped of his Empire, and afterwards of his Life: *Abaſſa* taking Occaſion therefrom, to revolt againſt his Succeſſor and Brother *Amurath* IV. by pretending that while at his Prayers in a *Moſque*, *Oſman*, the murthered Emperor, appeared to him, and calling to him, *Abaſſa*, ſaid he, the moſt faithful of all my Slaves, I command thee to revenge my Death by that of a hundred thouſand *Janizaries*. But they are now much leſs conſiderable. Their Number is, or ought to be fixed at twenty Thouſand.

The *Janizaries* are Children of Tribute levied by the *Turks* among the Chriſtians, and bred up to the military Life. They are taken at the Age of twelve Years, to the End that forgetting their Country and Religion, they may know no other Parent but the *Sultan*. However, generally ſpeaking, they are not at preſent raiſed by Way of Tribute; for the *Carach* or *Tau*, which the *Turks* impoſe on the Chriſtians, for allowing them the Liberty of their Religion, is now paid in Money, excepting in ſome Places where Money being ſcarce, the People are unable to pay in Specie, as in *Mingrelia*, and other Provinces near the *Black Sea*.

The Officer who commands the whole Body of the *Janizaries*, is called *Janizar Agaſi*; in *Engliſh Aga* of the *Janizaries*; who is one of the chief Officers of the Empire.

Though the *Janizaries* are not prohibited Marriage, yet they rarely marry, nor then, but with the Conſent of their Officers; as imagining a married Man to make a worſe Soldier than a Batchelor. *Vigenere* tells us, that the Diſcipline obſerved among the *Janizaries*, is extremely conformable in a great many Things, to that uſed in the *Roman* Legions.

The SPAHIS, as we have obſerved already, compoſe Part of the Cavalry of the *Ottoman Army*; their Commandant is called *Spahi Agaſi*.

The TIMARIOTS, are thoſe who enjoy Lands on the Footing and Tenure of *Timar*, which is a Tract or Portion of Land which the *Grand Seignior* grants to a Perſon, on Condition of ſerving him in War on Horſeback.

The *Timariots* are obliged to ſerve in War perſonally with as many Men and Horſes for Service as their *Timar*, by the Eſtimation made thereof, contains Times 2500 *Aſpers*, or about ſix Pounds Sterling; and to maintain them conſtantly mounted and armed after their Manner, to be ready to march at all Hours when commanded, and that on Pain of Death, nothing, not even Sickneſs itſelf, being allowed to excuſe them.

Beſides this Service, they likewiſe pay an Acknowledgment of one Tenth of their Revenue. If they have any Children of Age to bear Arms, and fit for the Service after their Deceaſe, or in Defect thereof, if they have any Relations that have the leaſt Intereſt, the *Timar* is uſed to be continued to them on the ſame Conditions; otherwiſe it is transferred to others.

If the Revenue thus held of the *Grand Seignior* exceed 15000 *Aſpers*, or 36 *l.* Sterling, they who hold it are not called *Timariots*, but *Subaſſi* or *Zaims*, and have the Adminiſtration of Juſtice in the Place.

The *Timariots* have different Appointments from 4 or 5000 *Aſpers*, equal to about 12 *l.* Sterling, to 20,000 *Aſpers*: But unleſs their *Timar* exceed 8000 *Aſpers*, they are never obliged to march, except when the *Grand Seignior* goes to the *Army* in Perſon, on which Occaſion none are exempted.

The Origin of the *Timariots* is referred to the firſt Sultans, who being Maſters of the Fiefs or Lands of the Empire, erected them into Baronies or Commanderies, to reward the Service of their braveſt Soldiers; and eſpecially to raiſe and keep on Foot a Number of Troops without diſburſing any Money. But it was *Soliman* II. that firſt eſtabliſhed the Order and Diſcipline among theſe Barons or Knights of the Empire; but Avarice, the ordinary Fault of the Orientals, has occaſioned their Declenſion of late Years. The Vice-Roys and Governors of Provinces manage their Matters ſo at Court, that *Timars*, even out of their Juriſdiction, are given to their Domeſticks, or to ſuch as will give the moſt Money for them.

There are two Kinds of *Timariots*, the one appointed by the *Porte*, the other by the Viceroy of the Country; but the Revenues of both are leſs than thoſe of the *Zaims*. Thoſe who receive their Patents from the Viceroys, have from 3 to 6000 *Aſpers per Ann.*

This *Cavalry* is better diſciplined than that properly called the *Spahis*, though the *Spahis* be the neateſt and briſkeſt. Theſe laſt only fight in Platoons; whereas the *Zaims* and *Timariots* are divided into Regiments, and commanded by Colonels, under the Direction of Baſhaws. The Baſhaw of *Aleppo*, when in the *Army*, is *Colonel-General* of this Militia.

Shepherds, Water-Carriers, and other ſuch undiſciplined Mob, compoſe the reſt of the *Ottoman* Forces or *Armies*.

Note, That the *Aſpers* which we have often mentioned in this Place, is a little *Turkiſh* Silver Coin, worth ſomething more than an *Engliſh* Halfpenny. The only Impreſſion it bears is that of the Prince's Name under whom it was ſtruck. The Pay of the *Janizaries* is from two to twelve *Aſpers per Diem*. Moſt of the *Grand Seignior's* Revenues are paid in *Aſpers*.

Our *Armies* antiently were a Sort of Militia, compoſed chiefly of the Vaſſals and Tenants of the Lords. When each Company had ſerved the Number of Days or Months enjoined by the Tenure, or the Cuſtoms of the Fees they held, they returned Home.

The *Armies* of the Empire conſiſt of divers Bodies of Troops furniſhed by the ſeveral Circles.

The Groſs of the *French Armies* under the *Merovingian*, or firſt Race of their Kings, conſiſted of Infantry. Under *Pepin* and *Charlemaign*, the *Armies* conſiſted almoſt equally of Cavalry and Foot; but ſince the Declenſion of the *Carlovingian* or ſecond Line, the Fees being become Hereditary, the national *Armies*, ſays *Le Gendre*, are chiefly Cavalry. The late King of *France*, *Lewis* XIV. has often brought twelve *Armies* into the Field, making up in all 500,000 Men.

As for *England* its greateſt Strength conſiſts in its *Naval Forces* or *Armies*; which NAVAL ARMIES are a Number of Ships of War, equipped and manned with Sailors and Marines, under the Command of an *Admiral* with other inferior Officers under him.

An ADMIRAL is a great Officer, who commands the *Naval Forces* of a Kingdom or State, and takes Cognizance by himſelf, or Officers appointed by him of all maritime Cauſes.

Du Cange aſſures us, that the *Sicilians* were the firſt, and the *Genoeſe* the next after them, who gave the Denomination *Admiral* to the Commanders of their *Naval* Armaments, and that they took it from the *Sarazen* or *Arabic Amir*, a general Name for any commanding Officer; though there are no Inſtances of *Admirals* in this Part of *Europe*, before the Year 1284; when *Philip* of *France*, who had attended St. *Louis* to the Wars againſt the *Sarazens*, created an *Admiral*.

The *French* have at preſent an *Admiral* in chief, called the *Great Admiral of France*, who is always a Perſon of the firſt Rank, and of an illuſtrious Birth. The late *Grand Admiral* was the *Count de Toulouſe*, natural Son of *Lewis* XIV. by Madam *Monteſpan*, who had under him two *Vice-Admirals*, one of the *Levant*, who was the Mareſchal *Deſtrees*, and the other of the *Ponant*, the Marquis *De Coetlogon*. The two *Vice-*

Admirals have alſo under them *Rear-Admirals*, *Lieutenant-Generals*, and chief *Deſcadres*. When the *Grand* or *High Admiral* commands in Perſon, the *Vice-Admirals* command each his Diviſion. A *French* Fleet is commonly divided into three Diviſions; the white Diviſion; the blue Diviſion; and the white and blue Diviſion. But when the *High* or *Grand Admiral* does not command in Perſon, 'tis always the *Vice-Admiral* of the *Levant* who commands in the *Mediterranean*, and that of the *Ponant* on the Ocean. The *Grand Admiral* carries a ſquared Flag, at the main Top-maſt, of blue Silk, embroidered with a golden *Sun*, with the late King's *Device* or *Motto*, *nec pluribus impar*. The *Vice Admiral*, when the Admiral commands in Perſon, carries his *Flag* at the mizen Top-maſt. The King of *France* has always 50000 Seamen regiſtered, who are obliged to paſs in Review before the Commiſſary of the Marine appointed for that Purpoſe in each Department or Diſtrict of the maritime Provinces, *viz. Britanny*, *Normandy*, *Poitou*, *Aunis*, *Provence*, *Guienne*, *Languedoc*, &c. on the firſt Notice given them by the ſaid Commiſſary; who chuſes from among thoſe who appear before him, as many Boatſwains, Gunners, Carpenters, Calkers, and common Sailors as he wants, without being obliged to preſs Vagrants or Men unacquainted with Sea Affairs, into that Service. Each Man of War, beſides its Complement of Sailors, has on board one or two Companies of Marines, which are independent Companies always kept in Pay, and exerciſed for that Purpoſe, beſides a Detachment or Brigade of *Guards Marines*, who are young Noblemen, brought up to the Sea at the King's Expence, and commanded by a *Brigadier*. Out of that Body of the *Guards Marines*, are taken all the Officers of the Navy, and they are promoted according to the Report made by their ſuperior Officer to the King, of their Courage, Knowledge, and Experience.

In every Sea Port there is a Commandant of the Marine, who is commonly a Captain of *haut Bord*, as they call it, or of a firſt Rate Man of War, and who commands all the Marines of that Department or Diſtrict; an Intendant of the Marines, who is Judge of the Court of *Admiralty* in that Place, and a Commiſſary of the Marine, who has under him a Comptroller, a Treaſurer, and ſeveral *Commis* or Clerks of his Office, which they call *Le Bureau des Claſſes*, becauſe there is kept the Regiſter of all the Sailors of that Department, wherein every Sailor is regiſtred according to his Rank and Employment.

The LORD HIGH ADMIRAL of *England*, in ſome antient Records called *Capitaneus Mariniorum*, is Judge or Preſident of the Court of Admiralty.

He takes Cognizance by himſelf, his Lieutenant or Deputies, of all Crimes committed on the Sea, or the Coaſt thereof, and all the civil and marine Tranſactions relating thereto: As alſo of what is done in all great Ships riding in any River, beneath the Bridges thereof next the Sea. We have had no High Admiral for ſome Years; the Office being put in Commiſſion, or under the Adminiſtration of the *Lords Commiſſioners of the Admiralty*.

Admiral is alſo uſed here, for the Commander in Chief of a ſingle Fleet or Squadron. Thus we ſay, the *Admiral* of the Red, the *Admiral* of the White, and the *Admiral* of the Blue. The Term *Admiral*, is alſo applied to all Flag-officers: In which Senſe it includes *Vice-Admirals*, and *Rear-Admirals*. No Nation in the whole World has ever produced a greater Number of braver *Admirals*, and other Sea-officers than *England*. Their heroick Actions have been admired and applauded under both Hemiſpheres; and their ſingle Appearance has always alarmed the Coaſts of the moſt formidable Enemies of the *Engliſh* Name; and no Doubt but our Poſterity will remember with as much Pleaſure and Gratitude, the *Bings*, *Skovels*, *Jennings*, *Norris*, *Hoſier*, *Wager*, *Vernon*, *Haddock*, *Ogle*, &c. as we do *Cavendiſh*, *Blake*, *Rooke*, &c.

ASTROLOGY.

ASTROLOGY, from the *Greek* αστηρ, Star, and λογος, Diſcourſe, is the Art of foretelling future Events from the Aſpects, Poſitions and Influences of the heavenly Bodies; which the better to underſtand we muſt conſider firſt what's *Aſpect*.

Kepler defines ASPECT an Angle formed by the Rays of two Planets meeting on Earth, able to excite ſome natural Power or Influence.

Aſtrology is divided by its Profeſſors and Students (as they are pleaſed to call themſelves) into two Branches, *Natural* and *Judiciary*.

Goad has compoſed two Volumes of the former, wherein he pretends, that Inundations may be foretold, and an Infinity of *Phænomena* explained, from the Contemplation of the Stars. Accordingly he endeavours to account for the Diverſity of Seaſons, from the different Situations and Habitudes of the Planets; from their retrograde Motions; the Number of fixed Stars in the Conſtellations, &c. This Kind of *Aſtrologers* pretend, that the Deluge was owing to a Conjunction of all the *Planets* in *Capricorn*; and that the *Conflagration* will be occaſioned by their Conjunction in *Cancer*.

Mr. *Boyle* endeavours to juſtify this Sort of *Aſtrology*, in his Hiſtory of the Air; and having preſuppoſed *Generation* and *Corruption* to be the Extremes of Motion, *Rarefaction* and *Condenſation*, the mean ones, he proceeds to ſhew, that the Effluvia of the heavenly Bodies, as we find them immediately to contribute to the latter, muſt alſo have a mediate Influence on the former; and conſequently all phyſical Bodies be affected thereby.

MEAD *de imperio Solis, & Lunæ*, &c. pretends, that it is evident that the Properties of Moiſture, Heat, Cold, &c. employed by Nature to produce the two great Effects of Rarefaction and Condenſation, almoſt wholly depend on the Courſe, Motion, Poſition, &c. of the heavenly Bodies. And that it is alſo clear, that every Planet muſt have its own proper Light, diſtinct from that of any other; Light being not a bare viſible Quality, but endued with its ſpecifick Power. That we know that the Sun not only ſhines on all the Planets, but by its genial Warmth calls forth, excites, and raiſes the Motions, Properties, &c. peculiar to them; and its Rays muſt ſhare or receive ſomewhat of the Tincture thereof; and thus tinged, be again reflected into the other Parts of the World, and particularly the adjacent Bodies of the planetary Syſtem. Whence according to the Angle the Planets make with that grand Luminary, and the Degree wherein they are enlightened, either by its direct or oblique Rays; together with their Diſtance or Situation, in Reſpect of our Earth; the Powers, Effects or Tinctures proper to each, muſt be tranſmitted hitherto, and have a greater or leſs Effect on ſublunary Things.

This Opinion (which I ſee diveſted of thoſe Principles it ſhould be founded upon, to demonſtrate thoſe Virtues or Qualities aſſigned to the heavenly Bodies) is refuted by ſome of the moſt eminent modern Philoſophers.

Rohault's *Tract. Phiſic. Par.* 2. *c.* 27. having preſuppoſed that it is impoſſible to revoke in Doubt the Influences of the Sun on all ſublunary Things, and conſidered it as the ſole and primary Cauſe of all the Effects which appear here on Earth, ſince if the Plants

grow, if the Harveſt ripens, and the Fruits are brought to Maturity, all that muſt be attributed to the Light, or rather Heat of the *Sun*, diveſt the other *Planets* of all thoſe Powers, Effects and Influences attributed to them by *Aſtrologers*, or their Partizans, unleſs it be thoſe which proceed from their Light, in which he confeſſes to be a Virtue or Power, to move the ſmalleſt Filaments of the optick Nerves; and as he ſuppoſes, at the ſame Time, that there are, in the *Air*, in the *Water*, and in the *Earth*, Particles as ſubtle and as eaſy to be moved as thoſe Filaments: He agrees that in ſuch Caſe, thoſe Particles can be ſaid to be influenced by the other Planets, as well as when the ſame unperceptible Particles, by agitating a more palpable Matter, produces ſome apparent Effects; but at the ſame Time, as the Light of the Sun is infinitely greater than that of all the other *Planets* joined together, he will alſo have all Effects they are ſuppoſed to produce, attributed to it as to their firſt Principle and principal Cauſe; ſo that if we perceive ſome Changes in the Conſtitution of the Air, though the *Sun* dart his Rays on the Earth in its accuſtomed Manner, thoſe Changes proceed rather from the preſent Diſpoſitions of the Air or Earth, than from the different Aſpect or Poſition of the other *Planets*.

This Author is even of Opinion, that this was the real and true Sentiment of the antient Philoſophers, pretending that what could have infatuated the *Egyptians* with the extravagant Belief of the Influences of the Stars, is, that their Aſtronomers having diſtinguiſhed the different Days of their ſolar Year, by the different fixed Stars, which were ſeen to riſe at the Declenſion of the *Sun* (at which Time they uſed to inform the People of the difference of the Seaſons, and of the Weather that was to accompany each Seaſon, that they might act accordingly, with Regard to the Culture of the Earth) the Vulgar concluded from thence, that ſome of the Stars were humid of their Nature, and brought Rain; others dry, and created Drought; that theſe were calculated for the Production of Plants, and theſe influenced the animal World. But that when they perceived by a long Experience, that the Temperature of the Air was not the ſame every Year, though the ſame fixed Stars roſe every Year, always in the ſame Place; and on the contrary the Planets had a *loco Motion*, they, at laſt, diveſted the fixed Stars, of thoſe Influences, they had for ſo long a Series of Years enriched them with, to beſtow them on the Planets.

The human Mind thus infatuated of the Power and Efficacy of the Planets, *Aſtronomers* have ſince attempted to diſcover, by what they call *Aſtronomical Calculus*, the Poſition of the Planets in future Ages, whereby they pretend to foretel Rains, the Serenity of the Air, the Winds, Thunder, Tempeſts, Plenty, Sterility, Plague, Wars, and the like; though we have annually ſeveral Inſtances of their groſs Miſtakes on that Particular only; while at the ſame Time they pretend that the Infallibility of their Principles, and the Exactitude of their *Calculus* is founded and confirmed by Experience; when on the contrary, they are ſo little capable of making ſo great a Number of Obſervations on the Conſtitution of the heavenly Bodies, that it is impoſſible they could make twice the ſame Obſervation, but within the Interval of ſeveral thouſand Years, ſince the Conſtitution of the Heaven, which is to be to Morrow, has not been ſeen yet ſince the Creation of the World.

Add to this, that if even *Aſtrologers* could obſerve what is to happen in future Ages, under certain Poſitions of the heavenly Bodies, that would be of no Service or Uſhty, but to thoſe who inhabit thoſe Countries where thoſe Obſervations are made, ſince it is evident, that what happens under one Hemiſphere, or even in one Climate, is not univerſal, and does not affect equally the whole Superficies of the Earth, for it often rains for the greateſt Part of the Year in one Country, while in another, they complain of a too great Siccity.

Nothing, for Example, is more vain and ridiculous, than what the greateſt Part of the *Europeans* have fancied of the Star called *Canicule*, which they imagine hot of its Nature, which is their Reaſon for calling the Time when that Star appears with the *Sun*, *Caniculary* or *Dog Days*, becauſe, perhaps, being at that Time in the Sign of the Lyon, it is not a great Diſtance from the *Canicule*, if ſo, the Heat muſt proceed from the Sun, not from the *Canicule*; therefore *Gaſſendi*, lib 6. ſect. 2. c. 1. *de ſiderum effectibus*, very judiciouſly obſerves, that the *Canicule* being placed beyond the *Equator*, with Reſpect to us, and paſſing over the Zenith of the meridional Parts of the Earth, at the ſame Time it appears to us to ariſe with the *Sun*, the Inhabitants of thoſe Parts feeling a violent Cold, at the ſame Time we are ſcorched with the moſt extreme Heat of the Summer Seaſon, could with a greater Appearance of Reaſon, ſuppoſe that Star of an extremely cold Nature; therefore we conclude, that there is no depending on the Calculations and Suppoſitions of a natural *Aſtrology*, and all the Predictions of *Aſtrologers*, as to the Viciſſitude and Changes of the Seaſons, and the various *Phænomena* happening therein, are frivolous and uncertain; for if it happens that ſome of them hit right, it is only by mere Chance or Accident, in which the moſt ignorant, could often ſucceed as well as the greateſt *Aſtrologer*; which Sentiment can eaſily be ſupported by what happened to *Lewis* XI, King of *France*, who going a hunting (having firſt aſked his *Aſtrologer* what Weather he ſhould have that Day) happened to meet upon the Road with the *Hut* of a Coal-man, which the King entered, and his Majeſty being told by him that it was a going to rain, as it really did a few Hours after, contrary to the *Aſtrologer*'s Opinion, who had foretold fair Weather; the King diſmiſſed the *Aſtrologer* and put the Coal-man in his Place: ſince this Man, by the halting of his Aſs, ſeverely bit by the Flies at the Approach of Rain, could with a greater Certainty foretel a Tempeſt, than the *Aſtrologer* by the Rules of his Art.

But nothing of this Kind has more flattered the criminal Curioſity of Mankind, than what they are pleaſed to call *Judiciary*, or JUDICIAL ASTROLOGY, which is that which pretends to foretel moral Events; that is to ſay, ſuch as have a Dependance on the Free-will and Agency of Man; as if it were directed by the Stars.

The Profeſſors hereof maintain, 'That the Heavens are one great Volume or Book, wherein God 'has wrote the Hiſtory of the World; and in which 'every Man may read his own Fortune, and the 'Tranſactions of his Time. The Art, ſay they, 'had its Riſe from the ſame Hands as *Aſtronomy* itſelf: 'while the antient *Aſſyrians*, whoſe ſerene un-'clouded Sky favoured their celeſtial Obſervations, 'were intent on tracing the Paths and Periods of 'the heavenly Bodies; they diſcovered a conſtant 'ſettled Relation or Analogy between them and 'Things below; and hence were led to conclude 'theſe to be the *Parcæ*, the *Deſtinies*, ſo much talk'd 'of, which preſide at our Births, and diſpoſe of our 'future State.'

This is the advantagious Opinion *Aſtrologers* have of that ſcandalous, vain, ſacrilegious and pretended Art, *Judicial Aſtrology*, which had its Origin from the Ignorance and too great Credulity of the Vulgar, and from the Avarice, Craft and Fraud of Thieves and Knaves, againſt whoſe Superchery, *Horace* himſelf cautions us, *Lib.* 1. *Ode* XI.

——————— *nec Babylonios*
Tentaris numeros.

i. e. Do not conſult the *Calculus* Tables or *Ephemerides*, uſed by *Aſtrologers*.

The chief Foundation of *Judicial Aſtrology*, is the Erection of a *Scheme*, at the Time given for the Moment of the Birth of a Perſon, whereby *Aſtrologers* pretend to diſcover what Star preſided at that Birth, that

that is to ſay, in what Part of our Hemiſphere that Star was placed, when ſuch Perſon came into the World. This Erection of their *Theme*, they pretend to perform with the Aſſiſtance of the *Celeſtial Globe*, or of the *Planiſphere*, with Regard to the *fixed Stars*; but as to the Planets, they do it with *Aſtronomical Tables*, or *Ephemerides*. To accompliſh which, they have Recourſe to a *Semi-circle*, which they call *Poſition*, by which they repreſent the ſix great Circles paſſing thro' the Interſection of the *Meridian* and *Horizon*, and dividing the *Equator* into twelve equal Parts. The Spaces included between theſe Circles, are what they call the twelve Houſes, and which they refer to the twelve Triangles marked in their *Theme*, placing ſix of thoſe Houſes above the *Horizon*, and ſix underneath the *Horizon*.

The firſt of the *Houſes* under the *Horizon* toward the Eaſt, they call the *Horoſcope*, or *Houſe of Life*; the ſecond, the *Houſe of Wealth*; the third, the *Houſe of Brothers*; the fourth, the *Houſe of Parents*, &c. as is clearly explained in the two following Verſes.

Vita, lucrum, fratres, genitor, natique, valetud',
Uxor, mors, pietas, & munia, amici, inimici.

Thus turned into *Engliſh* Meter by ſome *Students in Aſtrology*,

The firſt Houſe ſhews Life, the ſecond Wealth doth give;
The third how Brethren, fourth how Parents live;
Iſſue the fifth; the ſixth Diſeaſes bring;
The ſeventh Wedlock, and the eighth Death's Sting;
The ninth Religion; the tenth Honour ſhews;
Friendſhip the eleventh, and the twelfth our Woes.

The *Aſtrologers* draw their Table of the *twelve Houſes*, into a triple *Quadrangle* prepared for the Purpoſe, of which there are four principal Angles, two of which fall equally upon the *Horizon*, the other upon the *Meridian*, which Angles are ſubdivided into twelve Triangles for the twelve Houſes, and in thoſe Houſes they place the twelve Signs of the *Zodiack*, attributing to each of them their particular Quality, *viz.*

ARIES, denoted by this Figure, ♈, is in their extravagant Opinion, a maſculine, diurnal, cardinal, equinoctial, eaſterly Sign, hot and dry, the Day-houſe of *Mars*.

TAURUS, ♉, is a feminine, nocturnal, melancholy, beſtial, furious Sign, cold and dry.

GEMINI, ♊, is a maſculine Sign, hot and moiſt, diurnal, aerial, human, double bodied, *&c.*

CANCER, ♋, is a feminine, nocturnal, phlegmatick Sign, by Nature cold and moiſt, the only Houſe of *Luna*.

LEO, ♌, is a Sign, maſculine, diurnal, beſtial, cholerick and barren; a commanding, kingly Sign, hot and dry, the only Houſe of the *Sun*.

VIRGO, ♍, is a feminine, nocturnal, melancholy, and barren Sign.

LIBRA, ♎, is a Sign maſculine, cardinal, equinoctial, diurnal, ſanguine and human, hot and moiſt.

SCORPIO, ♏, is a feminine, nocturnal, cold and phlegmetick nothern Sign.

SAGITTARIUS, ♐, is a Sign, maſculine, cholerick and diurnal, by Nature hot and dry.

CAPRICORN, ♑, is a feminine, nocturnal, melancholy, ſolſtitial, moveable, cardinal and ſouthern Sign.

AQUARIUS, ♒, is a maſculine, diurnal, fixed ſanguine, and human Sign.

PISCES, ♓, is a feminine, nocturnal, phlegmatick, northerly, Double-bodied Sign, the laſt of the twelve.

Having thus houſed their Signs, and directed them in their Operations, they afterwards come to enquire of their Tenants, what Planet, and fixed Star they have for Lodgers, at the Moment of the Nativity of ſuch Perſon, from whence they draw infallible Concluſions (if one's Fool enough to believe them) with Regard to the future Incidents of that Perſon's Life. For Example, if at the Time of that Perſon's Nativity they find *Mercury* in 27 Degrees, 52 Minutes of *Aquarius*, and in the *ſextile Aſpect* of the *Horoſcope*; they foretel that Infant will be a Perſon of great Sagacity, Genius and Underſtanding, and therefore capable to learn the moſt ſublime Sciences, tho' perhaps at the very Time, the Accompliſhment of ſuch Prediction ſhould happen, he'll be accounted the greateſt Blockhead of his Time.

Aſtrologers imagine alſo, for the ſame ridiculous Purpoſe, to be in the ſame Houſes, different Poſitions of the Signs and Planets, and from their different Aſpects, Oppoſition and Conjunction, and according to the Rules and Axioma's they have preſcribed to themſelves, and invented, have the ſacrilegious Preſumption to judge, *in dernier reſort*, of the Fate of Mankind, though their pretended Art or Science is quite ſterile or barren in Proofs and Demonſtrations. For if they are aſked why they have divided the Heavens into twelve Houſes, rather than into a leſs or greater Number? Why the firſt muſt be rather a Houſe of *Life* than of *Death*? Why the ſecond a Houſe of *Wealth*, not of *Poverty*, &c. They'll give none but fictitious, vain, frivolous, chimerical and ſcandalous Anſwers, and none to the Purpoſe.

Moreover, not yet ſatisfied with this chimerical Partition of the Heaven into twelve Parts, they have Recourſe to other Methods, equally contrary to Experience and Reaſon, to direct the Signs of the *Zodiack*, and make them act according to their ridiculous Fancy. 1. They call ſome of thoſe Signs *Vernal*, or of the Spring, as *Aries*, *Taurus*, *Gemini*; ſome *Æſtival*, or of the Summer, as *Cancer*, *Leo*, *Virgo*. 2. Others are called by them *Cardinal*, as beginning the Seaſons, ſuch are *Aries*, *Cancer*, *Libra*, and *Capricorn*; others fixed, which have the Direction of the Middle of the Seaſons. 3. If we are Fools enough to believe thoſe Impoſtors, ſome of thoſe Signs are human; as *Gemini* and *Virgo*; ſome are wild, voracious, Beaſts of Prey, as *Aries* and *Taurus*. 4. Some have an enchanting Voice, and in all Appearance have preſided at the Birth of *Seneſino*, *Farinelli*, &c. and theſe are *Gemini* and *Virgo*; though they had done better, to place *Gemini* ſomewhere elſe, ſince ſuch delicate Voices as thoſe here mentioned, do not admit of *Copulation*; others have no Voice at all, as *Piſces*. 5. Some, as we have already obſerved, are maſculine and diurnal, as *Aries*; ſome feminine and nocturnal, as *Taurus*; though for my Part I could never diſcover any Sign of Muliebrity in a *Taurus*; but I ſuppoſe that *Aſtrologers* mean thereby, that *Taurus* has a very great Influence upon the fair Sex, eſpecially in the Night. 6. Some are prolifick, fruitful, as *Piſces*; though begging thoſe *honeſt Gentlemen*'s Pardon, ſuch Excellence had been far better appropriated to *Taurus*; others barren, as *Virgo*, which by that I ſuppoſe to be a very old Maid; others hot, others cold, handſome, ugly, fat, lean; ſome govern certain Countries and Cities, as *Aries*, *England*, *France*, *Germany*, *Sileſia*, *Poland*, *Denmark*, *Burgundy*, *Syria*, &c. *Ancona*, *Capua*, *Naples*, *Ferrara*, *Florence*, *Verona*, *Marſeilles*, &c. *Taurus*, *Ruſſia*, *Swedeland*, *Lorain*, *Switzerland*, *Perſia*, *Zeland*, *Cyprus*, &c. Therefore we ought not to be ſurprized if ſome of our beſt Stallions come out of ſome of thoſe Countries. And thus all the reſt of the *Signs*.

The PLANETS have allowed them, every one, except *Sol* and *Luna*, two Signs for their Houſes; to SATURN, the *Capricorn* and *Aquarius*; to JUPITER, *Sagittarius* and *Piſces*; to MARS, *Aries* and *Scorpio*; to SOL, *Leo*; to VENUS, *Taurus* and *Libra*; to MERCURY, *Gemini* and *Virgo*; and to LUNA, *Cancer*.

The *Planets* by their continual Mutation through the twelve *Signs*, make ſeveral Angles or Aſpects, the moſt forcible of which are theſe five.

☌ *Conjunction*,

☌ *Conjunction*, △ *Trine*, □ *Quadrate*, ✶ *Sextile*, ☍ *Opposition*.

A CONJUNCTION is when two *Planets* are in one and the same Degree and Minute of a Sign; and this is, say our Jugglers, either good or bad, as the *Planets* are either Friends or Enemies.

A TRINE is when any two *Planets* are four Signs, or 120 Degrees distant, as *Mars* is in 12 Degrees of *Aries*, and *Sol* in 12 Degrees of *Leo*. Here *Sol* and *Mars* are said to be in Trine Aspect. And this is an Aspect of perfect Love and Friendship; by which I understand that Friendship in the Zodiack, as here upon Earth, is always greater and more perfect, when Friends are at some Distance from one another.

A QUADRATE *Aspect* is when two *Planets* are three Signs, or 90 Degrees distant, as *Mars* in 10 Degrees of *Taurus*, and *Venus* in 10 Degrees of *Leo*. This particular Aspect is of imperfect Enmity, and *Astrologers* say, that Persons signified thereby, may have Jars at some Time, but such as may be reconciled again.

A SEXTILE *Aspect* is when two *Planets* are two Signs, or 60 Degrees distant, as *Jupiter*, in 15 Degrees of *Aries*; and *Saturn*, in 15 Degrees of *Gemini*; here *Jupiter* is in a *Sextile* Aspect to *Saturn*. This is an Aspect of Friendship.

An OPPOSITION, is when two *Planets* are diametrically opposite, which is, when they are six Signs, or 180 Degrees (which is one Half of the Circle) asunder and this is an Aspect of perfect Hatred.

A PARTILE *Aspect*, is when two *Planets* are in a perfect Aspect to the very same Degree and Minute.

DEXTER *Aspects*, are those which are contrary to the Succession of Signs, as a *Planet* in *Aries* casts its *sextile Dexter* to *Aquarius*.

SINISTER *Aspect* is with the Succession of Signs, as a *Planet* in *Aries* casts its *sextile Sinister* in *Gemini*.

Astrologers play a great many other diverting Tricks, or *Tours de Passe Passe*, with the *Planets*, for they cannot let those celestial Bodies stay long in the same Lodging. They must be always on the moving Strain; therefore there are Application, Prohibition, Separation, Translation, Refrenation, Combustion, Exception, Retrogradation, and what not, of *Planets*.

The APPLICATION of *Planets* is performed by them, three Ways. 1. When a light *Planet* being direct and swift in Motion, applies to a *Planet* more ponderous, and slow in Motion, as *Mercury* in 8 Degrees of *Aries*, and *Jupiter* in 12 Degrees of *Gemini*, and both direct; here *Mercury* applies to a *Sextile* of *Jupiter*, by direct *Application*. 2. When they are both retrograde, as *Mercury* in 20 Degrees of *Aries*, and *Jupiter* in 15 Degrees of *Gemini*; here *Mercury*, the lighter *Planet*, applies to the *sextile Aspect* of *Jupiter*; and this is by *Retrogradation*. 3. When one of the *Planets* are direct, and the other retrogade; as suppose *Mercury* were retrogade in 18 Degrees of *Aries*, and *Jupiter* direct in 14 Degrees of *Gemini*; here *Mercury* applies to a *Sextile* of *Jupiter*, by a retrograde Motion.

PROHIBITION, is when two *Planets* are applying either by Body or Aspect; and before they come to their *partile* Aspect, another *Planet* meets with the Aspect of the former, and so prohibits it.

SEPARATION, is when two *Planets* have been lately in *Conjunction*, or *Aspect*, and are separated from it.

TRANSLATION of Light and Virtue, is when a lighter *Planet* separates from the Body or Aspect of a more weighty one, and immediately applies to another superior *Planet*, and so translates the Light and Virtue of the first *Planet* to that which it applies to.

REFRENATION, is when a *Planet* is applied to the Body or Aspect of another; and before it comes to it, falls retrograde, and so refrains by its retrograde Motion.

COMBUSTION. A *Planet* is said to be combust of *Sol*, when it is within 8 Degrees 30 Minutes of his Body, either before or after their Conjunction; but *Astrologers* complain, that a Planet is more afflicted when it is applying to the Body of *Sol*, than when it is separating from *Combustion*.

RECEPTION, is when two Planets are in each others Dignities, and it may be either by House, Exaltation, Triplicity, or Term.

RETROGRADATION, is when a Planet moves backward from 20 Degrees to 9, 8, 7, and so out of *Taurus* into *Aries*.

FRUSTRATION is when a swift Planet applies to the Body or Aspect of a superior Planet; and before it comes to it, the superior Planet meets with the Body or Aspect of some other Planet.

To the seven *Planets*, viz. *Saturn*, *Jupiter*, *Mars*, *Sol*, *Venus*, *Mercury* and *Luna*, *Astrologers* add two certain Nodes or Points, called the *Dragon's-Head*, distinguished by this *Sign* ☊, and the *Dragon's-Tail* by this other ☋. In those two Extremities of the Beast, our Students in *Astrology* place such Virtues, that they can draw from thence Wealth, Honours, Preferments, *&c.* enough to flatter the Avarice, Ambition, Vanity, *&c.* of the Fools who follow them, or to affright them, not out of their Wits, for it cannot be supposed that they have the least Tincture of it, but of their Money, in order to render the Aspect more favourable, in Case the *Dragon* was to shew his Teeth or cock up his Tail.

The strongest Arguments employed by *Astrologers* to support their Principles, and defend their Doctrine, are Experience, and the Authority of Historians, who have witnessed the Truth of an infinite Number of Predictions by the Event. As *Spurina* having bid *Julius Cæsar* to beware the Ides of *March*, on which he was stabb'd in the Capitol; and *Socrates* foretold the Death of *Crito*. *Calanus*, an *Indian*, cautioned *Alexander* against entring *Babylon*, lest he should die there, and *Sulla* forewarned *Caligula* of his Death. The *Astrologer* to *Frederick* II. Emperor of *Germany*, having foretold his Master that he should be succeeded in the Empire by *Rodolphus* of *Hapsbourg* (though the Emperor had at that Time ten Sons alive) which happened accordingly, *Rodolphus* having been elected King of the *Romans* by the *Germans* in 1273 *Regiomontanus*, having pointed out in 1475 all the great Changes, Revolutions, and remarkable Incidents which happened, especially in *France*, in 1588; as the Barricado of *Paris*; the King's Flight from thence; the Slaughter of the Duke *de Guise*, and of his Brother, the Cardinal, at *Blois*; the Death of the Queen-mother; the Poisoning of the Prince of *Conti*; the Overthrow of the Duke of *Mercœur* by the King of *Navarre*. The Defeat of the *Turks* in *Hungary*; and the *Spanish Armada* designed against *England* dispersed at Sea by the Tempest. *Michael Nostradamus*, of St. *Remi* in *France*, having foretold, in his Book of Centuries, printed in *French*, in 1555, the Martyrdom of King *Charles* I. in *England*, and also the Fire of *London* in 1666, although 100 Years after *Nostradamus*'s Death; and many other Things passed and yet to come.

To this, I answer, 1. That the Credit, or Authority of an Historian, let him be ever so impartial and so faithful, is not of such Weight, and so infallible as not to be mistaken in several Circumstances and Incidents, giving us often Things for Facts, which have never been in Being. 2. Since they are as often deceived by the Memoirs, and Relations from which they compile their Histories, as they deceive us. We must know by Experience, that Historians are sometimes obliged to supply the Deficiency of their Memoirs, and to fill the Vacancies of their Histories with publick Reports, which are almost always partial or false, and even sometimes without the least Foundation; and when they have any, 'tis often nothing else but Suppositions and Conjectures; and without being obliged to go further than our own Times, and our own Country, for Proofs to confirm what I advance here, are we not daily entertained with Incidents, which had never any other Existence, but in a common Report, contradicted the next Day by another

common Report, both Reports being a few Days after deſtroyed by the real Truth. How often our daily and weekly Hiſtorians entertain us with every Circumſtance of the Death of Perſons, even of their Neighbours, who at that very Time are alive and in perfect Health; and if thoſe Hiſtorians can be ſo groſsly impoſed upon by a publick Report, and can ſo groſsly impoſe upon us, by neglecting to be better informed of ſuch Incidents before they give them to us as Fact; could not thoſe pretended Predictions, alledged by *Aſtrologers* to ſupport their Principles, and which the Hiſtorians of thoſe Times have tranſmitted to us as Facts, have been as many Romances, impoſed on them by the Report of the Vulgar? I'll agree with them, if they pleaſe, that *Julius Cæſar* was forewarned of his unhappy Cataſtrophe, by *Spurina*, which *Spurina* could have done, without being a *Conjuror*, or an *Aſtrologer*; for the following Reaſons. 1. He knew very well that *Julius Cæſar*, by uſurping a ſupreme Authority, and by his endeavouring to enſlave the *Roman* Liberty, contrary to the fundamental Laws of the Republick, had revolted the moſt conſiderable Part of the Senate againſt him; and that the *Romans*, not accuſtomed to that inſupportable Yoke *Cæſar* was bringing them under, would uſe all the Means imaginable, and lay hold of the firſt Opportunity to ſhake it off. 2. *Spurina* could be well enough acquainted with the Humours, Inclinations, Firmneſs, Reſolution, and Courage of the Senators, who oppos'd *Cæſar*'s Uſurpation, as to know them capable of undertaking any Thing, ſo far as to ſacrifice their own Lives to the *Roman* Liberty, and ſo enterpriſing as to concert Meaſures, even the moſt deſperate, to break their Chains. 3. *Spurina* was perhaps privy to the Conſpiracy formed againſt *Cæſar*, and to the Manner it was to be put in Execution, but as he was not willing to expoſe the Conſpirators to *Cæſar*'s Reſentment, and would, at the ſame Time, ſave *Cæſar*'s Life, whom he knew worthy of the Empire, and if the *Romans* muſt be enſlaved, it could not be done by a more deſerving Maſter, and more capable to command them, he adviſed *Cæſar* to take Care of himſelf, only as a Friend. 4. That knowing that nothing could be undertaken againſt the Emperor's Perſon, while at the Head of his Armies, or amidſt his Friends, the Senate, where he came always accompanied but with very few of them, was the propereſt Place for that Purpoſe. 5. Even the Circumſtance of the *Ides* of *March*, the only one that gives to *Spurina*'s Advice an Air of *Prediction*, could be added to it without the Intervention of *Aſtrology*; ſince we have all the Reaſon to ſuppoſe, that it was publickly known at *Rome*, that *Julius Cæſar* had fixed that Day for his being preſent at that Auguſt Aſſembly, where Affairs of the greateſt Conſequence were to be debated, the ſame as we often know here, when our Kings are to go to their Parliament; therefore this pretended Prediction proves nothing in Favour of judicial *Aſtrology*; neither do the Hiſtorians of thoſe Times inform us that *Spurina* was an *Aſtrologer*, or knew *Julius Cæſar*'s future Cataſtrophe, with the Aſſiſtance of the *Planets*. The ſame might be ſaid of *Sulla* forewarning *Caligula* of his Death, ſince any Body elſe, without being a Conjurer, who knew the Humour of the *Romans*, could have concluded from that Emperor's ill Conduct, and his inſulting Manner of treating the Senate, that he run the Riſque of an untimely Death. As to *Regiomontanus* and *Noſtradamus*'s Predictions, they were conceived in ſuch obſcure and unintelligible Terms, that they have never been underſtood but after the Event, and even then but by a Suppoſition that they meant ſuch a Thing.

2. Let it be even admitted, that among a World of the *Aſtrologers* Predictions they have ſometimes happened to hit the Truth, that's rather to be attributed to a pure Hazard than to the Certainty of their Rules; according to this Obſervation of *Phavorius*, *in Aul. Gell. Lib.* 14. *Nat. Attic. c.* 1. *Iſta omnia quæ aut temerè, aut aſſutè vera dicunt, præ cæteris quæ mentiuntur, non ſunt Pars Milleſima.* Beſides, *Aſtrologers* have often, even according to the beſt Rules of their Art, foretold a different Fate, from the ſame Poſition of Heaven, and the ſame Fate from a different Poſition, as is evident from the two *Horoſcopes* of *Luther*, (mentioned by *Gaſſendi*, *Sect.* 2. *Phyſ. Lib.* 6. *c. ult.*) in which *Cardanus* and *Gauricus*, two famous *Aſtrologers*, and ſtrenuous Aſſerters of the Principles of *Aſtrology*, have found the ſame Fate, though in a different Poſition of Heaven, and with the Difference of a Year. What could *Aſtrologers* ſay of *Eſau* and *Jacob*, who though born at the ſame Time, had, nevertheleſs, ſo different a Fate? Was the ſame *Horoſcope* drawn for all thoſe who were put to the Sword in the Battle of *Marathon*? Or for thoſe in different Countries, and at different Times, met together in the ſame Ship, and are altogether loſt in a Naufrage? An Objection, which St. *Auguſtin*, *Lib.* 7. *Confeſſ. c.* 6. aſſures us could never be ſolved, by *Aſtrologers*. *Cardanus* himſelf, was ſo conſcious of the Fallacy and Incertitude of his Principles, that having foretold his Death, and afraid he ſhould be miſtaken in his *Ephemerides*, ſtarved himſelf to Death to ſave his Reputation, and died at *Rome* in 1576.

Tullius himſelf, during the darkeſt Clouds, and greateſt Obſcurity of Paganiſm, while Religion itſelf ſeemed to countenance *Aſtrology*, inveighs ſeverely againſt it. *Quam multa*, ſays he, *Lib.* 2. *de Divinat. ego Pompeio quam multa Craſſo, quam multa huic ipſi Cæſari a Chaldæis dicta memini, Neminem eorum niſi Senectute, niſi Domi, niſi cum Claritate eſſe moriturum? Ut mihi per Mirum videatur quemquam extare, qui etiam nunc Credatis, quorum prædicta quotidie videat Re & Eventis refelli. i. e.* I ſo well remember the *Chaldæans* Predictions to *Pompey*, to *Craſſus*, and to this ſame *Cæſar*, that none of them ſhould die, but full of Years and Glory, and in his Houſe, that I am ſurprized, that there are yet ſome Perſons capable to believe thoſe, whoſe Predictions are every Day contradicted and refuted by the Event.

We muſt not forget here thoſe vain, ridiculous, and inſignificant Figures, invented by the *Chaldæans*, *Perſians*, *Ægyptians*, and *Arabs*, called in the *Arabic* Language *Taliſmans*; which are the Seal, Figure, Character or Image of a heavenly Sign, Conſtellation or Planet, engraven on a Sympathetick Stone, or on a Metal, correſponding to the Star, *&c.* in order to receive its Influences; and to which *Aſtrologers* attribute ſome ridiculous, marvellous Effects; as thoſe of curing Diſtempers, of rendering Perſons invulnerable, *&c.* ſo that a Figure of Lead, called *Saturn* by the Alchymiſts, made a *Saturday*, called alſo the Day of *Saturn*, and imprinted with the Character of *Saturn*, being tied to the Neck of a Perſon who has the Plague, which, ſay they, is a Saturnian Diſtemper, will effectually cure him.

The TALISMANS of the *Samothracians*, ſo famous of old, were Pieces of Iron formed into certain Images, and ſet in Rings, *&c.* They were held Preſervatives againſt all Kinds of Evils. There were other *Taliſmans* taken from Vegetables, and others from Minerals.

In the general we uſe to diſtinguiſh three Kinds of *Taliſmans*: *Aſtronomical*, which are known by the Signs or Conſtellations of the Heavens engraven thereon, with other Figures, and ſome unintelligible Characters. *Magical*, which bear very extraordinary Figures, with ſuperſtitious Words, and Names of Angels unheard of. And *Mixt*, which conſiſt of Signs and barbarous Words, but have no ſuperſtitious ones, or Names of Angels.

Some *Rabbins* maintain, that the Brazen Serpent, raiſed by *Moſes* in the Wilderneſs, was a *Taliſman*; and thereby have the ſacrilegious Preſumption to debaſe that into a ſcandalous, vain, and criminal Invention, which was a Miracle of the Divine Providence.

All the miraculous Things wrought by *Apollonius Tyanæus*, are attributed to the Virtue and Influence of *Taliſmans*; and he is even ſaid to have been the Inventor of *Taliſmans*.

Aſtrologers have alſo made uſe of all their beſt Artifices,

fices, and employed all the Rules of their pretended Art, to render thoſe Years of our Age, which they call *Climacſtericks*, dangerous and formidable.

CLIMACTERICK, from the *Greek*, κλιμακτηρ, *q. d.* by a Scale or Ladder, is a critical Year, or a Period in a Man's Age, wherein, according to thoſe Jugglers, there is ſome notable Alteration to ariſe in the Body; and a Perſon ſtands in great Danger of Death.

The firſt *Climacſterick*, ſay they, is the ſeventh Year of a Man's Life; the reſt are Multiples of the firſt, as 21, 49, 56, 63, and 84; which two laſt are called the *Grand Climacſtericks*, and the Dangers here ſuppoſed more imminent.

Marc Ficinus gives us the Foundation of this Opinion: He tells us there is a Year aſſigned for each *Planet* to rule over the Body of Man, each in his Turn; now *Saturn* being the moſt maleficent *Planet* of all, every ſeventh Year, which falls to its Lot, becomes very dangerous; eſpecially thoſe of 63 and 84, when the Perſon is already advanced in Years.

Some hold, according to this Doctrine, every ſeventh Year an eſtabliſhed *Climacſterick*; but others only allow the Title to thoſe produced by the Multiplication of the climacſterical Space by an odd Number, 3, 5, 7, 9, *&c.* Others obſerve every ninth Year as a *Climacſterick*.

Hevelius has a Volume under the Title of *Annus Climacſtericus*, deſcribing the Loſs he ſuſtained in the Burning of his Obſervatory, *&c.* which it ſeems happened in his firſt *Grand Climacſterick*. *Suetonius* ſays, *Auguſtus* congratulated his Nephew upon his having paſſed his firſt *Grand Climacſterick*, whereof he was very apprehenſive.

Some pretend that the *Climacſterick* Years are alſo fatal to political Bodies; which perhaps may be granted, when it is proved that they are ſo to natural ones; for I muſt confeſs that I cannot diſcover the Reaſon of ſuch Danger, nor what Relation it can have with the Numbers above-mentioned. Though this Opinion has a great deal of Antiquity on its Side. *Aulus Gellius* ſays, it was borrowed from the *Chaldeans*, who might probably receive it from *Pythagoras*, whoſe Philoſophy turned much on Numbers, and who imagined an extraordinary Virtue in the Number 7.

Authors on the Subject, are *Plato*, *Cicero*, *Macrobius*, *Aulus Gellius*, among the Antients; *Argol*, *Magirus*, and *Salmatius* under the Moderns. St. *Auguſtin*, St. *Ambroſe*, *Beda*, and *Boetius* countenance the Opinion.

Aſtrologers have alſo brought under their Inſpection the Days of the Years which they have the Preſumption to divide into lucky and unlucky Days, calling even the ſacred Text, and the common Belief of Chriſtians, in former Ages, to their Aſſiſtance on this Occaſion. They pretend that the fourteenth Day of the firſt Month was a bleſſed Day among the *Iſraelites*, authoriſed therein, as they pretend, by the ſeveral Paſſages out of *Exod.* xii. 18, 40, 41, 42, 51. *Levit.* xxiii. 5. *Numb.* xxviii. 16. *Four hundred and thirty Years being expired of their dwelling in* Egypt, *even in the ſelf ſame Day departed they thence.*

As to evil Days, and Times they refer to *Amos* 5. 13, *and* 6. 3. *Eccles.* 9. 12. *Pſal.* 37. 19. *Obad.* 12. *Jer.* 46. 21.—and to *Job* curſing his Birth Day, *Chap.* 3. *v.* 1 to 11. In Confirmation thereof, they alſo quote a Calendar, which they pretend to have extracted out of ſeveral Manuſcript Roman Catholick Prayer Books, written upon Vellum before the Invention of Printing, wherein were inſerted the unfortunate Days of each Month, as in the following Verſes.

JANUARY. *Prima dies menſis, & ſeptima truncat ut Enſis.*
FEBRUARY. *Quarta ſubit mortem, proſternit tertia Fortem.*
MARCH. *Primus mandentem, diſrumpit quarta bibentem.*
APRIL. *Denus & undenus eſt mortis vulnere plenus.*
MAY. *Tertius occidit, & ſeptimus ora relidit.*
JUNE. *Denus palleſcit, quindenus fœdera neſcit.*
JULY. *Ter denus mactat, Julii denus labefactat.*
AUGUST. *Prima necat fortem, perditque ſecunda Cohortem.*
SEPTEMBER. *Tertia Septembris, & denus fert mala membris.*
OCTOBER. *Tertius & denus, eſt ſicut mors alienus.*
NOVEMBER. *Scorpius eſt quintus, & tertius eſt vita tinctus.*
DECEMBER. *Septimus exanguis, viroſus denus ut Anguis.*

This Poetry taſtes much of the Ruſticity and Ignorance of thoſe Times, and is a convincing Proof that Chriſtianity had yet a very ſtrong Tincture of the Pagan Superſtitions, which the Purity of the Goſpel has not been capable yet to blot out among us.

That ſuch ridiculous Notion of lucky and unlucky Days, owes its Origin to a Pagan Superſtition, may be proved from the *Roman* Hiſtorians, who mention that that very Day four Years, the *Civil Wars* were begun by *Pompey* the Father; *Cæſar* made an End of them with his Sons, *Cneius Pompeius* being then ſlain; and that the *Romans* accounted *February* the 13th an unlucky Day, becauſe on that Day they were overthrown by the *Gauls* at *Allia*, and the *Fabii* attacking the City of the *Recii*, were all ſlain ſave one. From the Kalendar of *Ovid*'s *Faſtorum*. *Aprilis erat Menſis Græcis Auſpicatiſſimus*; and from *Horace*, *Lib.* 2. *Ode* 13. Curſing the Tree that had like to have fallen upon him.

Ille ne faſto te poſuit Die.

What has contributed much to confirm the Pagans as well as the Chriſtians in their Opinion on that Subject, are the ſeveral remarkable Events happened at ſome particular Days. As *Alexander the Great*, being born the 6th of *April*, having conquered *Darius*, and died the ſame Day. The Emperor *Baſſianus Caracalla*, being born the 6th of *April*, and died the ſame Day. *Auguſtus* having been adopted the 19th of *Auguſt*, began his *Conſulate*, conquered the *Triumviri*, and died the ſame Day.

As for the Chriſtians they have obſerved that the 24th of *February* was four Times fortunate to *Charles* V. Emperor. That *Wedneſday* was a fortunate Day to Pope *Sextus* V. for on a *Wedneſday* he was born; on that Day made Monk; on the ſame Day made General of his Order; on that Day created Cardinal; on that Day elected Pope; and alſo on that Day inaugurated. That *Thurſday* was a fatal Day to *Henry* VIII. King of *England*, and his Poſterity, for he died on *Thurſday*; King *Edward* VI. on *Thurſday*; Queen *Mary* on *Thurſday*; and Queen *Elizabeth* on *Thurſday*. The *French* have obſerved that the Feaſt of Pentecoſt had been lucky to *Henry* III. King of *France*, for on that Day he was born; on that Day elected King of *Poland*, and on that Day he ſucceeded his Brother *Charles* IX. on the Throne of *France*.

Since I have mentioned *Henry* III. I cannot help taking Notice here, that *Judicial Aſtrology* has never been more in Vogue than it was in *France*, ſucceſſively under the Reigns of the three Brothers, *Francis* II, *Charles* IX, and *Henry* III; through the great Encouragement *Aſtrologers*, Fortunetellers, and other ſuch Impoſtors met with, from the Queen-Mother, *Catherine* of *Medicis*. That wicked Woman was ſo infatuated with the Notion of *Aſtrology*, that that ſuperſtitious Science was the ſole Directreſs of all her Actions; and ſhe had thought it a Crime to have undertaken any Affair, of the leaſt Conſequence, without having conſulted firſt ſome of her *Aſtrologers*, of whom ſhe had always a certain Number near her Perſon. Once, in particular, having been foretold by ſome of them, that all her four Sons would be Kings, and afraid they meant Kings of *France*, which could not

not have happened, without the Reign of all of them had been very ſhort; ſhe had one elected King of *Poland*, and offered the *Grand Seignior*, that the *Duke d'Alençon* ſhould turn *Mahometan*, if he would make him Emperor of *Morocco*.

This predominant Humour in that Court, was well rallied by *Barclay*, in his *Argenis*, Lib. II. on Occaſion of an *Aſtrologer*, who had undertook to inſtruct King *Henry* III. in the Event of the War, then threatened by the Faction of the *Guiſes*.

'You maintain, ſays *Barclay*, that the Circumſtances of Life and Death depend on the Place and Influence of the celeſtial Bodies, at the Time when the Child firſt comes to Light; and yet own that the Heavens revolve with ſuch vaſt Rapidity, that the Situation of the Stars is conſiderably changed in the leaſt Moment of Time. What Certainty, then, can it be in your Art, unleſs you ſuppoſe the Midwife conſtantly careful to obſerve the Clock; that the Minute of Time may be conveyed to the Infant, as we do his Patrimony? How often does the Mother's Danger prevent this Care? And how many are there who are not touched with this Superſtition? But ſuppoſe them watchful to your Wiſh; if the Child be long in Delivery; if, as is often the Caſe, a Hand, or the Head come firſt, and be not immediately followed by the Body; which State of the Stars is to determine for him? That when the Head made its Appearance; or when the whole Body was diſengaged? I ſay nothing of the common Error of Clocks, and other Time-keepers, ſufficient to elude all your Cares.

'Again, Why are we to regard only the Stars at his Nativity, and not thoſe rather which ſhone when the Fœtus was animated in the Womb? And why muſt thoſe others be excluded which preſided while the Body remained tender, and ſuſceptible of the weakeſt Impreſſion during Geſtation?

'But ſetting this aſide; and ſuppoſing, withal, the Face of the Heavens accurately known: Whence ariſes this Dominion of the Stars over our Bodies and Minds, that they muſt be the Arbiters of our Happineſs, our Manner of Life and Death? Were all thoſe who went to Battle, and died together, born under the ſame Poſition of the Heavens? And when a Ship is to be caſt away, ſhall it admit no Paſſengers, but thoſe doomed by the Stars, to ſuffer Shipwreck? Or rather, do not Perſons born under every Planet go into the Combat, or aboard the Veſſel; and thus, notwithſtanding the Diſparity of their Birth, periſh alike? Again, all who were born under the ſame Configuration of the Stars, do not live or die in the ſame Manner. Are all who were born at the ſame Time with the King, Monarchs? Or are they all even alive at this Day? View M. *Villeroy* here; nay, view yourſelf: Were all that came into the World with him, as wiſe and virtuous as he; or all born under your own Stars, *Aſtrologers* like you? If a Man meets a Robber, you will ſay he was doomed to periſh by a Robber's Hand; but did the ſame Stars which, when the Traveller was born, ſubject him to the Robber's Sword; did they likewiſe give the Robber, who perhaps was born long before, a Power and Inclination to kill him? For you will allow it as much owing to the Stars that the one kills, as that the other is killed. And when a Man is overwhelmed by the Fall of a Houſe, did the Walls become faulty, becauſe the Stars had doomed him to die thereby; or rather was not his Death owing to this, that the Walls were faulty? The ſame may be ſaid with Regard to Honours, and Employs: Becauſe the Stars that ſhone at a Man's Nativity, promiſed him Preferment, could thoſe have an Influence over other Perſons not born under them, by whoſe Suffrages he was to riſe? Or how do the Stars, at one Man's Birth, annul or ſet aſide the contrary Influences of other Stars, which ſhone at the Birth of another?

'The Truth is, ſuppoſing the Reality of all the Planetary Power; as the Sun, which viſits an Infinity of Bodies with the ſame Rays, has not the ſame Effect on all; but ſome Things are hardened thereby, as Clay; others ſoftened, as Wax; ſome Seeds cheriſhed, others deſtroyed; the tender Herbs ſcorched up, others ſecure by their coarſer Juice: So, where ſo many Children are born together, like a Field tilled ſo many different Ways, according to the various Health, Habitude, and Temperament of the Parents, the ſame celeſtial Influx muſt operate differently. If the Genius be ſuitable and towardly, it muſt predominate therein; if contrary, it will only correct it. So that to foretel the Life and Manners of a Child, you are not only to look into the Heavens, but into the Parents, into the Fortune which attended the pregnant Mother; and a thouſand other Circumſtances utterly inacceſſible.

'Further, does the Power that portends the newborn Infant a Life, for Inſtance, of forty Years; or perhaps a violent Death at thirty; does that Power, I ſay, endure and reſide ſtill in the Heavens, waiting the deſtined Time, when, deſcending upon Earth, it may produce ſuch an Effect? Or is it infuſed into the Infant himſelf; ſo that being cheriſhed, and gradually growing up together with him, it burſts forth at the appointed Time, and fulfils what the Stars had given it in Charge? Subſiſt in the Heavens it cannot; in that depending immediately on a certain Configuration of the Stars, when that is changed, the Effect connected with it muſt ceaſe, and a new, perhaps a contrary one, take Place. What Repoſitory, then, have you for the former Power to remain in, till the Time comes for its Delivery? If you ſay it inheres or reſides in the Infant, not to operate on him till he be grown to Manhood; the Anſwer is more prepoſterous than the former: For this, in the Inſtance of a Shipwreck, you muſt ſuppoſe the Cauſe why the Wind riſes, and the Ship is leaky, or the Pilot, through Ignorance of the Place, runs on a Shoal, or a Rock. So the Farmer is the Cauſe of the War that impoveriſhes him; or of the favourable Seaſon which brings him a plenteous Harveſt.

'You boaſt much of the Event of a few Predictions, which, conſidering the Multitude of thoſe your Art has produced, plainly confeſs its Impertinency. A Million of Deceptions are induſtriouſly hidden and forgot, in Favour of ſome eight, or ten, which have ſucceeded. Out of ſo many Conjectures, it muſt be preternatural if ſome did not hit; and it is certain, that conſidering you only as Gueſſers, there is no Room to boaſt you have been ſucceſsful therein. Do you know what Fate awaits *France* in this War; and yet are not apprehenſive what ſhall befal your ſelf? Did not you foreſee the Oppoſition I was this Day to make you? If you can ſay whether the King ſhall vanquiſh his Enemies; find out firſt whether he will believe you.'

This Reaſoning of *Barclay*, and theſe Objections he makes to Queen *Catherine*'s *Aſtrologers*, evidence well enough the Vanity and Ridicule of their Art; but it does not ſhew, to the general Satisfaction, in what that Vanity conſiſts, nor how it is impoſſible the different Configurations of the *Planets* ſhould have ſo great an Influence, at our Births, as to determine, at that very critical Moment, the future various Incidents of our Life: Therefore to elucidate this important Subject in a ſtill clearer Manner than *Barclay* has done, I'll take the Liberty to make here the following Reflections, which, I hope, will ruin the whole Syſtem of *Aſtrology*, Divination, Fortune-telling, Interpretation of Dreams, *&c.*

Nothing is more monſtrous, than to ſuppoſe that our temporal Fate is under the Influence of the fixed Stars, for theſe Reaſons. Firſt, Before we admit of ſuch Influences, we muſt preſuppoſe, thoſe heavenly Bodies endued, from their firſt Formation, with an unlimited Power, for the ſole Direction and Oeconomy of the whole Terraqueous Globe, and of all that is contained therein; and even ſuppoſe alſo, which would

be a ſacrilegious Temerity, that the very Power of the ſupreme Being, or to ſpeak like *Chriſtians*, the divine Providence herſelf, is to be controlled, oppoſed, and diſappointed, or elſe has reſigned the ſole and entire Government of the Globe, to the celeſtial Bodies, ſtanding only as an idle Spectatreſs, of all the Events they are pleaſed to operate among the ſublunary Beings, ſo far as to force Nature it ſelf to a Compliance; unleſs we'll rather believe, that the heavenly Bodies are as Inſtruments in the Hands of a ſupreme Being, which he makes uſe of to cauſe the viſible Changes and Viciſſitudes which happen among us. If ſo, why ſhould theſe Changes and Events be confined to the Velocity of a momentaneous, and ſingle *Configuration* of the heavenly Bodies? Why ſhould a ſingle Aſpect of thoſe heavenly Bodies, be of ſuch Efficacy, as to neceſſitate all the future Events of our Life, ſo as to be accounted as irrevocable as the Decrees of the ſupreme Being? Why ſhould the different Poſition of the heavenly Bodies change the Nature of their Aſpects? Can ſuch a Poſition which happens on the firſt Moment of our Birth, govern all the Actions of our Life, till our Death? Are their Operations, or rather Influences, phyſical, or metaphyſical? If phyſical, how can they influence Things which have not yet any Exiſtence? Or could it be poſſible, that we ſhould have, within us, ſome organical Part, among the reſt, not yet diſcovered by Anatomiſts, which, like the Needle of a Compaſs, is ſuſceptible of the moſt ſubtle Effluvia's of the Stars and Planets, wherewith it is ſo ſtrongly impregnated at our Birth, as to move always towards thoſe *Poles* it has been directed to at firſt, ſo that if that Needle has been touched by the magnetic Side of the *Star*, or *Planet*, which puſhes us into a pacific Sea, (our Life being compared to an Ocean) we'll meet throughout our Navigation on that Sea, with nothing elſe but Calms, a ſerene Sky, and favourable Winds: But if, on the contrary, the Needle has been touched on the wrong Side of the Star or Planet, we are to expect nothing but Storms, Tempeſts, a boiſterous Sea, and at laſt an unfortunate Naufrage; if ſo, how can that Needle preſerve always the ſame Qualities it has received at the firſt Inſtant of its Impregnation; without being obliged, by the too great Diſſipation of its Effluvia's, to return under the ſame Poſition of the Planet or Star, for to be touched and directed a-new? And if it is ſo ſuſceptible of the Influences of the heavenly Bodies, how comes it to paſs, that when quite exhauſted of its former Qualities, and meeting with a Configuration of the ſame, or of another Planet, different from the firſt, it does not likewiſe receive a different, or contrary Direction? Is it becauſe it has received, at one and the ſame Time, both attractive and repulſive Virtues or Qualities, and that when it meets under a different Configuration, the repulſive Qualities repel, or oppoſe the Introduction of Qualities different from thoſe it received at firſt? If ſo, there muſt be an Atmoſphere ſubſiſting between the ſuppoſed *Needle*, and that Side of the Star or Planet it has been firſt touched with; which Atmoſphere, muſt be ſo ſtrong, and of ſo compact a Nature, by the firm Adheſion of the Corpuſcles it is compoſed of, to each other, as to keep always the ſame Continuity, notwithſtanding the Velocity of the Motions of the heavenly Bodies, and the violent and continual Agitation of an Atmoſphere of a far greater Volume it is environed with. But it is impoſſible there ſhould be ſuch an Atmoſphere ſubſiſting between the heavenly Bodies and the ſublunary Beings, conſidering the immenſe Diſtance which ſubſiſts between both, which keeps us in the Dark, as to their true Poſition, their Motion, Phaſes, Configuration, Progreſſes, *&c.* ſince all we pretend to know of it is by mere Suppoſition and Conjecture; and if we do not ſo much as know what's their Subſtance, and how they exiſt, how can we pretend to know how they operate, ſince by their immenſe Diſtance from us we have no clearer Proofs or Demonſtration of the one than of the other; how can we pretend that they influence our Actions, and decide of our Fate, ſince we have not the leaſt eſſential Reaſon to ſuppoſe that they are capable to produce any ſuch Effects? How do we know but that the Stars are nothing elſe but inſenſible Bodies, and which have nothing to deſerve our Attention, but that glimmering Light, which affects none of our Senſes but our Sight, and who knows but that Light is even a borrowed one, and reflected on the Planiſphere thro' the Opacity of their Bodies, like that of the *Moon*, ſince it is deemed by the Radiancy of the *Sun*.

What's the more ſurprizing to me is, that we have the Folly to have Recourſe to the fixed Stars, and to the ſuperior *Planets*, as *Saturn*, *Jupiter*, &c. which are ſo far out of our Knowledge, for Effects which could be eaſier produced by the inferior ones, as the *Sun* and *Moon*; for would it not be more reaſonable to attribute to the *Sun*, which by his Heat fertilizes our Fields, reanimates our natural Warmth, when in the moſt languiſhing State, and revives Nature itſelf; and by its Light enlightens our Hemiſphere; all the marvellous Effects and Operations we would force on the ſuperior Planets, ſince its Effects affect our Senſes, and thoſe attributed to the other Planets, only our Imagination? Is it not more juſt to believe, that a Planet, in whoſe Abſence, all ſublunary Things, ſenſible, as well as inſenſible, appear in Mourning, or are thrown into Convulſion, can influence our Deſtiny, or diſpoſe of our Fate, than others, which when in their greateſt Glory ſpread a dark Veil over all the Beauties of the viſible World, and condemn the whole Creation to a profound Silence? The Revolution of the Seaſons, which happens while the *Sun* is running his annual Courſe through the *Zodiac*; during which our Conſtitution is ſubject to ſeveral Changes and Viciſſitudes, might very well make us ſuppoſe that we are in ſome Meaſure under the Influences of that *Planet*, as to the various Incidents of our natural Life, but not as to thoſe of our civil one; for its moſt bearing Influences cannot contribute otherwiſe towards our temporal Felicity, than to render us, by exhilerating our Spirits, inſpiring us with Chearfulneſs and Gaiety, and keeping us in a flouriſhing State of Health, more capable to apply ourſelves to our ſeveral Occupations, or by fertilizing our Lands increaſe our Stores; but never ſo far as to render ſome Moments of our civil Life more critical than others; therefore, if we cannot, nor ever have attributed thoſe Effects to a *Planet*, which, we know, produces daily ſo many other viſible ones, though of a quite different Nature, how can we, with the leaſt Appearance of Reaſon, conſider them as proceeding from the Poſition or Configuration of the moſt diſtant *Planet*, which remains inactive, with regard to all other Sublunary Events, but thoſe which have no other Exiſtence but in our Imaginations. How can we carry our Folly even ſo far, as to pretend that the different *Poſitions*, and Configurations of thoſe *Planets*, have no Influence upon us but at the critical Moment of our Birth, and then only on future Events, which perhaps are not to happen, but after we have met under the ſame Configuration of that very ſame *Planet* we are born under, or a contrary one ſeveral Times in the Courſe of our Life? If the *Planets* have ſo ſtrong a Power, as to be capable to direct or govern Incidents *in Fieri*, or to come, would it not be more reaſonable to ſuppoſe that Power ſtronger, and leſs reſiſtible, when the Influence is immediate, and to believe that the various Incidents of our Lives are governed or directed by that *Planet*, under whoſe Aſpect they happen? What! Have the heavenly Bodies entered into a Confederacy, or rather agreed among them not to contradict or oppoſe what any of them ſhall have ordered; even ſo far, as when we have had the Unhappineſs to be born under a malign Aſpect, they have all concerted to look with the ſame evil Eye on the different Incidents of our Lives, which muſt be, elſe, a benign Aſpect of a *Planet*, under which ſome of thoſe Events ſhould happen, muſt infallibly over-balance the malign Influences of our Birth?

Our wiſe *Aſtrologers* will object, perhaps, that Man

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at his Birth, being like a ſoft Wax ſuſceptible of any Impreſſion, and the firſt Impreſſion of any Kind whatever being always the ſtrongeſt, the *Planet* which preſides at his Birth, taking Advantage of that critical Moment of his firſt Appearance into the World, ſeizes, with its Influences, all his Faculties, and in ſo efficacious a Manner, as to be utterly impoſſible afterwards to blot out thoſe primary Traces. But I would aſk them in my Turn, where are thoſe Impreſſions made, if on our corporeal or ſpiritual Subſtance? If on our corporeal Subſtance, and by the Pores of our Bodies, being more dilated and open at our Birth, than at any other Time, the Effluvia's of the *Planet*, which preſides then, being quicker in their Motion, than thoſe of the other Atmoſpheres, the Infant is at that Time wrapp'd in, ſeize ſo effectually thoſe Interſtices, as to oppoſe the Admiſſion of any others; and circulating afterwards with the Fluids, communicate the Figuration to the moſt ſubtle Particles of our Subſtance, and thereby cauſe that Sympathy, which ſubſiſts ever after, between the Aſpect of the *Planet*, and our Microcoſm. This Sort of reaſoning would certainly prove ſomething in Favour of the judicial *Aſtrology*, that is to ſay, as far as it could be poſſible that the *Planet*, which has preſided at our Birth, could influence our Conſtitution, *viz.* render it phlegmatick, ſanguine, bilious, *&c.* agreeable to the Qualities we ſuppoſe to be in that *Planet*; and ſubject to the Maladies attributed to it, as to their Origin and principal Cauſe; and perhaps ſome Incidents of our Lives, proceeding from the Humours predominant in that Conſtitution, could be conſidered as the Effects of the Aſpects of the *Planets*, *viz.* Prudence and Diſcretion, in a phlegmatick Courage; and Intrepidity in a ſanguine; Moroſity, Spite, Malice, Revenge, in an atrabilary; Rage, Paſſion, Fury, *&c.* in a bilious; though we have not the leaſt Occaſion to run ſome Millions of Leagues out of our Way, for the Origin of thoſe Effects, which can be all attributed to nearer and more natural Cauſes; ſince we muſt be convinced that the Conſtitution of our Parents, the Difference of the Climate, and even the firſt Rudiments of our Education, can operate all thoſe different Changes within us.

But if it was even ſo true, that the Difference of our Paſſions proceeded from the different Aſpects of the *Planets* at our Birth, if we be pleaſed to conſider that thoſe Paſſions, let them be ever ſo violent, can be brought under the Direction of our Reaſon, and often ſilenced by her; we'll find that it is ridiculous to pretend to draw Concluſions from thence, with Regard to the different Events of our Lives. How often do we ſee two Perſons born under the ſame Aſpect of the ſame *Planet*, one prodigal, and the other parcimonious, one brave and couragious, and the other puſillanimous and a Coward; one giving a full Career to his Paſſions, and the other, though born with the ſame Paſſions, refraining them; one in the Phrenzy of thoſe Vices cutting his Throat, or hanging himſelf, and the other bearing with much Patience and Reſignation the ſame Diſappointments, without anticipating the Decrees of a ſupreme Being? On the other Side could it be reaſonably ſuppoſed, that five, ten, fifteen, or twenty Thouſand Men, killed in the ſame Battle, were all born under the ſame malign Aſpect of a *Planet?* And ſince the Loſs of a Battle affects equally the Prince, whoſe Army has been beaten; the General who commands that Army; and the Troops 'tis compoſed of; I would aſk an *Aſtrologer* (ſince the Event is equally fatal to the Prince, to the General, and to the Army) to which Aſpect is that Event to be attributed? Is it to that which influenced the Birth of the Prince, or that of his General, or of his Soldiers? If to the *Planet* which preſided at the Birth of the Prince only? Then the *Aſtrologer* has been diſappointed, who has calculated the Nativity of the General, and of his Army; if to the malign Aſpect which preſided at the Birth of the General; there is likewiſe a Diſappointment on the Side of the Prince. But perhaps, the *Planets*, in a grand Council, had reſolved to bring none into that Army, but thoſe born under a malign Aſpect? If ſo, why ſhould that ſame *General*, who has loſt a Battle this Time, gain a Victory the next, though commanding the ſame Army, and for the ſame Prince? Why ſhould one who has always been victorious, and always attended with the greateſt Succeſs, all ſufficient Proof that he was born under a benign Aſpect, be carried off at laſt by a Cannon-ball, or ſome other unforeſeen Accident? If any *Aſtrologer* can anſwer this Argument as it ſhould be, *erit mihi magnus Apollo.*

To pretend that the various Aſpects of the Heavenly Bodies can influence our ſpiritual Subſtance, or the Faculties of our Souls, is not only a monſtrous Paradox, but likewiſe a prophane and ſacrilegious Temerity: For I'll ſpeak in this Place as a Chriſtian, ſince I ſpeak to Perſons, who pretend to profeſs the Religion of Chriſt in its greateſt Purity; what greater Inſult can be offered to the divine Providence, than to inveſt a created and inſenſible Being, formed only for the juſt Symmetry and Ornament of this viſible World, (for we are not certain yet, that ſome of the heavenly Bodies are placed in their Orb for any other Uſe) with a ſupernatural Power, which he has reſerved to himſelf, founded only on the ſcandalous Report or Evidence of Jugglers and Impoſtors, contrary to the beſt eſtabliſhed Principles of Chriſtianity? How can thoſe who have not entirely renounced Piety, Virtue, Religion, or even Senſe and Reaſon, expect to find their Fate written within the Compaſs of the Circles of an *Aſtrologer*, which they know to be in the Hands of their Divine Creator? How can they ſuppoſe, the various Incidents of their Lives to be under the immediate Direction or Influence of the Stars or *Planet*, when the Holy Ghoſt himſelf aſſures them, that not even a Hair falls from their Heads, without a ſpecial Leave from the Almighty? To countenance, encourage, or even tolerate ſuch ſcandalous and criminal Practices; is it not breaking into an open Rebellion againſt his irrevocable Decrees? And to attempt to penetrate into Futurity, what is it elſe, but endeavouring to diſcover the moſt hidden Secrets of his ſacred Wiſdom? How can we have ſo mean an Opinion of ourſelves, to ſuppoſe that we are under the Influence of a created Being, when we have ſo many certain and undeniable Proofs of the Exiſtence of a ſupreme, eternal, immortal, uncreated, and incomprehenſible Ruler of this vaſt Univerſe? Why are we not aſhamed to acknowledge a Superiority over us, in a Being ſo inferior to us in all Reſpects; and which we cannot ſuppoſe to act otherwiſe, than according to the Caprice and Phantaſy of Viſionaries and Impoſtors? For we ſhould be all convinced by this Time, that all thoſe Poſitions, Oppoſitions, and Configurations of the *Planet*, their different Houſes, *&c.* have no other Exiſtence but in the empty *Pericranium* of *Aſtrologers*; and if even they had any other, the immenſe Space between them and us could let us know nothing of it but by Conjecture. What Pleaſure then can we take in deceiving ourſelves? Is our Lives ſo continued a Series of Peace and Tranquillity, that we ſhould be ſo much tired of it, as to endeavour to diſturb it by a criminal Curioſity? Are not the Dangers we are expoſed to on the tempeſtuous Sea of this World frequent enough, without our ſeeking after chimerical ones in Places we know nothing of?

To this chimerical Doctrine of the heavenly Bodies, we may add in this Place, all the other Tricks, Impoſtures, and *Legers de Main*, made Uſe of by *Aſtrologers*, Jugglers, and Fortune-tellers, to decoy us into their Nets, and pick our Pockets. There is ſcarce a Corner in our Streets, which, notwithſtanding the ſalutary Laws made againſt ſuch ſcandalous and criminal Practices, is not peſtered with the Emiſſaries of Students in *Aſtrology*, and who take Care to inform young buxom Laſſes in a longing Condition for a Huſband; Wives tired of theirs; barren Ladies, who want to be rendered Prolifick; young Widows, who would be glad to find ſome Body uneaſe enough to renew the Leaſe of their Freehold, *&c.*

That in such a Place lives a Student in *Astrology*, or Star-Gazer, who resolves all lawful Questions (as he calls them) by the Help not only of the *Stars* and *Planets*, but likewise of *Brizomancy*, *Chiromancy*, &c.

BRIZOMANCY, is the pretended Art of foretelling future Events by *Dreams*.

Macrobius mentions five Sorts of *Dreams*, *viz.* 1. a *Vision*, 2. A Discovery of something between Sleep and Waking. 3. A Suggestion cast into our Fancy, called by *Cicero*, *Visum*. 4. An ordinary *Dream*, and, 5. A Divine Apparition or Revelation in our Sleep; such as were the *Dreams* of the Prophets, and of *Joseph*, as also of the *Magi* of the East.

The fictitious Art of interpreting *Dreams*, had its Origin among the *Egyptians* and *Chaldeans*, those Countries being fertile in Superstitions of all Kinds. The same Art was brought from thence, among the *Romans*, who judging some *Dreams* worthy of Observation, appointed Persons on purpose to interpret them. Those who pretend that Dreams are Significatives of Things to come, bring in Confirmation of their Opinion, an infinite Number of *Dreams*, which have been the Fore-runners of very singular Events; *viz*, *Calphurnia*, *Julius Cæsar*'s Wife, dreaming the Night before his Death, that she saw him stabbed in the Capitol. *Artorius*, *Augustus*'s Physician, dreaming before the Battle of *Philippi*, that his Master's Camp was pillaged. The Emperor *Vespasian* dreaming an old Woman told him, that his good Fortune would begin, when *Nero* should have a Tooth drawn, which happened accordingly. *Cæsar* dreaming he committed Incest with his Mother, was crowned Emperor of *Rome*: And *Hippias* the *Athenian* Tyrant dreaming the like, died shortly after, and was interred in his Mother Earth. *Mauritius* the Emperor, who was slain by *Phocas*, dreaming a little before, that an Image of Christ which was over the brazen Gate of his Palace, called him and charged him with his Sins, and in the End demanded of him, whither he would receive the Punishment thereof in this Life or the next; and he answering in this, the Image commanded he should be given, with his Wife and Children, into the Hands of *Phocas*. Whereupon *Mauritius* awaking in great Fear, asked *Philippus* his Son in Law, whether he knew any Soldier in the Army called *Phocas*; he answered there was a Commissary so called: And *Phocas* was his Successor, having killed him, with his Wife and five Children. *Arlet*, while with Child of *William the Conqueror*, dreaming that a Light did spread from her Womb, that shone all over *England*. *Maia*, *Virgil*'s Mother, Prince of the *Latin* Poets, dreaming she was delivered of a Laurel Branch, *&c.*

The most pious of our *Dreamers*, and the most devoutly inclined Interpreters of *Dreams*, have even Recourse to the *Roman* Catholick Religion, to strengthen their Opinion, by pretending that many of the religious Orders have been first occasioned by Warnings delivered to the Authors of them in *Dreams*; as the Order of *Trinitarians*, *Augustinians*, of the Nuns of *St. Katharine*, &c. the *Camaldulenses*; the Monks of *St. Anthony*, &c.

But all the *Dreams* above-mentioned, prove nothing in favour of our Interpreters of *Dreams*; for they are of a quite different Kind from those they pretend to interpret; and we are not obliged to believe, as an Article of Faith, the Reality even of these, here quoted; at least as to some of their Circumstances. For Example, it could very well happen, that *Calphurnia*, having her Imagination seized with Fears and Terrors, occasioned by the ambitious Enterprises of *Cæsar* her Husband, who was then enslaving a bold and couragious People, used to Liberty, should dream of the Danger the Emperor was exposed to, and even perhaps that she saw him murthered. For in these Sorts of *Dreams*, occasioned, either by Fear, or a violent Desire, the Animal Spirits assigned for the Function, or rather Operations of the several Faculties of our Souls, being kept in a perpetual and uncommon Motion, by the Absence of the Object, only formed yet by the Imagination, and offered by her to the other Faculties, to be feared or wished for; cannot be susceptible of Quietude or Rest, till they be fixed once, or by the real Appearance of that Object, or by a Certitude of its being for ever absent; till then they are like the Needle of a Compass, kept in perpetual Motion by the Load-Stone, which one should turn round the Compass, even at some very considerable Distance from it.

As for the *Dreams* of the Founders of religious Orders, they were certainly real *Dreams*; for a great many of them used to dream awake as well as asleep, and some have done nothing else all their Life-time but dreamed; the Maceration of their Bodies, by continual fasting, praying and watching, contributed much towards keeping almost always their *Brain* free from those Fumes, which obstruct the too great Agitation of the Animal Spirits, retard their Circulation, and occasion a profound Sleep. During those few Hours they were forced to indulge Nature, contrary to their Inclinations, they dreamed they saw the Object they had always present to their Imagination while awake, and imagined they had with him those mystical Conversations, they communicated afterwards to their Disciples. Some are of Opinion, that those *Dreams* revealed by the Patriarchs of religious Orders to their Disciples, were nothing else but political Inventions, forged by them on purpose to gain a greater Number of Proselytes, and engage them to embrace a Manner of Life so contrary to our natural Inclinations, which perhaps they had not been so ready to do, if they had not been made believe that it was founded on divine Inspiration.

But it is ridiculous to compare the *Dreams* minded by the Vulgar, and which they want to be interpreted by Conjurers and Fortune tellers, to these Sorts of *Dreams*; since what they want to know, is, what is meant when they *dream* that they see *Ants*, *Armed Men*, *Asses*, *Black-Birds*, *Birds fighting*, *Candles burning*, *Children born*, a *Cross*, *Dragons*, *Eagles*, *Broken Eggs*, *Fire*, *Flies*, *Fountains*, *White Horses*, *King* or *Queen*, &c. that they *commit Adultery*, *eat Apples*, *cut Bacon*, *eat Bacon*, *bathe in a clear Fountain*, *in stinking Water*, *eat Beans*, *have a long Beard or Hairs*, *hear Bells ring*, *hear a Cock crow*, *fall in the Dirt*, *hear a Dog bark*, *lose their Eyes*, *or their Teeth*, *gather Grapes*, *fall on the Ground*; and an Infinity of other silly Questions, which the Impostor Interpreter has the Impudence, in Defiance of all Laws and Authority, to call lawful Questions, and on whose Interpretation the ignorant Querist has but too often the Folly to build an imaginary Fortune. The ridiculous Infatuation of *Dreams* is so predominant here, even among Persons who should know better, and especially the Fair Sex, that seldom a Conversation passes without some *Dreams* or other being brought on the Tapis, to be interpreted by the Company. I *dreamed* last Night, says one, that I had lost some of my Teeth; that's a Sign, says another, that you'll lose some of your Relations; I am afraid I shall, replied the *Dreamer*, for my Cousin, or Uncle, or Brother such a one, is very ill; that's a very sure Sign, says a third, for I *dreamed* once the same Thing, and my poor Husband (fetching then an affected Sigh) died soon after; Not so sure neither, objected a Fourth, for I *dream* often that I lose my Teeth, and my Husband is yet alive, and not likely to die soon as I know of, though he is a very great Rogue to me. But what signifies my *dreaming* last Night that I rode a great Horse, asked a pretty Miss, who all the while had been very attentive to the Interpretation of *Dreams* propos'd? That's a very good Sign, Miss, answer'd the Interpreter, and signifies Joy; ah, says another, and that you'll soon be married, for riding signifies Matrimony; what, riding to the Devil, asks another, in a Sort of Passion, for that's all the Riding I have met with since I have been married; Lord, Madam, says the *dreaming* Miss, you was not always of that Opinion, for, while a Maid, you had as great an Inclination for

that Jant as any of your Neighbours; when I was a Maid, ſay you, Miſs, I'll be glad to know when that was? And thus the whole Converſation is ſpent in telling and interpreting Dreams; and the next Opportunity the pretty Miſs goes to a Fortune-teller, to know if he'll confirm the Opinion of the firſt Interpreter of her *Dream*, that ſhe'll be married ſoon.

What ſurprizes me moſt, is, that this ridiculous Notion is ſo ſtrongly inculcated in the Minds of Children, from their very Cradle, that it is utterly impoſſible to root it out afterwards. If Parents are not themſelves aſhamed of that ſcandalous Infatuation, which is a Plague to all thoſe they are acquainted with, they ſhould however have Tenderneſs enough for their Children, to forbear inſtructing them in the Principles of that ſcandalous and ridiculous Doctrine, which contributes ſo much toward diſturbing their domeſtick Peace and Tranquillity, and render them inſupportable to themſelves, and to thoſe who are to live with them. Often the firſt Salute a Husband receives from his Wife, in a Morning, is the Recital of her *Dreams*, and half the Day is ſpent in nothing elſe but relating and interpreting them. All the Goſſips ſhe is viſited by, muſt paſs their Verdict upon it, and the Husband often obliged, to avoid being teazed with it, to forſake his Houſe, till ſome other Incidents have forced the Dreamer to forget her *Dream*. Such Practice ſmells ſo much of Paganiſm and Idolatry, that it is a Scandal to Chriſtianity, as entirely contradictory of the Orders of the divine Providence. Why does not our Clergy thunder from the Pulpit againſt it, and repreſent it as an Artifice of the Tempter of Mankind, to decoy our Souls into his Net? Why does not the Legiſlature puniſh it with the greateſt Severity?

Avicen makes the Cauſe of Dreams to be an ultimate Intelligence moving the *Moon* in the Middle of that Light with which the Fancies of Men are illuminated while they ſleep. *Ariſtotle* refers the Cauſe thereof to common Senſe, but placed in the Fancy. *Averroes* places it in the Imagination. *Democritus* aſcribes it to little Images, or Repreſentations, ſeparated from the Things themſelves. *Plato* among the ſpecifick, and concrete Notions of the Soul. *Albertus* to the ſuperior Influences which continually flow from the Sky, through many ſpecifick Mediums. And ſome Phyſicians impute the Cauſe thereof to Vapours and Humours, and the Affections and Cares of Perſons predominant when awake: For, ſay they, by Reaſon of the Abundance of Vapours which immoderate Feeding exhales, the Brain, being therewith ſtuffed, forms infinite Monſters, and ſtrange Chimæra's, whereof the greateſt Eaters and Drinkers may well ſatisfy us. Some Dreams, continue they, are governed partly by the Temperature of the Body, and partly by the Humour which abounds moſt in them; to which may be joined, the Apprehenſions which have preceded the Day before, which is diſcovered in Hounds, and ſome other Creatures, which bray and bark in their Sleep. As for Dreams, conclude they, proceeding from the Humours and Temperature of the Body, we ſee the *Cholericks* dream of burning, Combats, yellow Colours, *&c.* The *Phlegmaticks*, of Water, Baths, of ſailing upon the Sea, *&c.* The *Melancholicks*, of thick Fumes, Deſarts, Fantaſies, hideous Faces, *&c.* The *Sanguines*, of merry Feaſts, Dances, *&c.* They that have the hinder Part of their Brain ſtopp'd with clammy Humours, called by Phyſicians *Ephialtes incubus*, or, as we call it, the *Night Mare*, imagine, in dreaming, that they are ſtifled. And they that have the Orifice of their Stomach charged with malignant Humours, are affrighted with ſtrange Viſions, by Reaſon of thoſe venomous Vapours that mount into the Brain, and diſtemper it.

For my Part, I attribute the Cauſe of *Dreams* to an extraordinary Direction made by a ſuperior Faculty, made in our Imagination of the Spirits aſſigned to receive the Impreſſion from the firſt Perception of an Object; which Spirits, remaining, thereby, longer than uſual in their Poſition, retain the Image of the Object as *vivid* as when firſt imprinted on them. It alſo often happens, that thoſe Spirits, having been equally directed towards two different Objects while we are awake, wanting, while aſleep, the Regulation of our Reaſon, repreſent thoſe two Objects as if they were but one, and make a Monſter of it; repreſenting, ſometimes, the Head of a Lyon placed on the Shoulders of a Man, or *vice verſa*.

CHIROMANCY, from χειρ, Hand, and μαντεια, Divination; is the Art of divining the Fate, Temperament, and Diſpoſition of a Perſon, by the Lines and Lineaments of the Hand; otherwiſe called *Palmiſtry*.

We have a Number of Authors on this vain, and trifling Art; as *Pythagoras*, *Helenus*, *Ptolemæus*, *Hermes*, *Avicen*, *Racis*, *Artemidorus*, *Fludd*, and *Johannes de Indagines*; *Taiſnerus* and M. *De la Chambre* have done the beſt.

This laſt inſiſts on it, that the Inclinations may be known by inſpecting the Hand, there being a very near Correſpondence between the Parts of the Hand, and the internal Parts of the Body, the Heart, Liver, *&c.* whereon the Paſſions and Inclinations much depend. He adds, however, that the Rules and Precepts of *Chiromancy* are not ſufficiently warranted, the Experiments whereon they ſtand not being well verified. He concludes, that there muſt be a new Set of Obſervations, made with Juſtneſs, and Exactitude; in order to give *Chiromancy* the Form and Solidity which an Art or Science demands.

This fictitious Art is only practiſed by *Gypſies*, Vagabonds, and ſilly old Women; who have, however, Cunning enough to make the Vulgar believe that the ſeven *Planets* predominate over the ſeven Mountains this Art places in the Palm of a Man's Hand; and that the Lines therein have a Doctrine of Community with the Length of Life; and that Riches, Accidents, or other Events, are to be judged of thereby.

Of all theſe fanciful Arts of the Ancients, diffuſed among the Moderns, there are none which have ſo much Foundation in Nature as *Phyſiognomy* and *Metopoſcopy*.

PHYSIOGNOMY, (from φυσις, Nature, and γινωσκω, I know) is the Art of knowing the Humour, Temperament, or Diſpoſition of a Perſon, from Obſervation of the Lines of his Face, and the Characters of his Members or Features.

There ſeems to be ſomething in *Phyſiognomy*, and it may, perhaps, bear a much purer Philoſophy, than what the modern Authors who have wrote upon it, *viz. Baptiſta Porta*, and *Robert Fludd*, were acquainted with. We really believe, that there is an apparent Correſpondence between the Face and the Mind; that the Features and Lineaments of the one, are directed by the Motions and Affections of the other; that there is even a peculiar Arrangement of the Muſcles of the Face, a peculiar Diſpoſition of the Countenance to each particular Affection, perhaps to each particular Idea of the Mind.

In Effect, the Language of the Face, *Phyſiognomy*, is as copious, nay, perhaps, as intelligible, and diſtinct as that of the Tongue, and Speech. Thanks to bounteous Nature, ſhe has not confined us to one only Method of converſing with each other, and of learning each other's Thoughts: We have ſeveral; we do not wholly depend on the Tongue, which may happen to be bound; and the Ear, which may be deaf; but in thoſe Caſes, we have another Reſource, the Countenance, and the Eye, which afford us this further Advantage, that by comparing the Reports of the Tongue (a Member exceedingly liable to deceive) with thoſe of the Face, the Prevarications of the other may be detected.

If it be asked how ſuch an Impreſſion ſhould be effected? Some will anſwer, that it follows from the Oeconomy of the Creator, who has fixed ſuch a Relation between the ſeveral Parts of the Creation, to the End we may be apprized of the Approach or Receſs of Things uſeful and hurtful to us. But this, in

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my Opinion, is a very ſilly Anſwer, and which has not the leaſt Report to the Queſtion propoſed. Therefore I'll rather chuſe to ſay, that the Creator, whoſe Wiſdom is infinite, conſidering that the Mechaniſm of the ſeveral Parts which compoſe an organical Body, let it be ever ſo perfect, could not, however, ſubſiſt always, in the ſame juſt and exact Symmetry it came out of his ſacred Hands, without being expoſed to many Changes, Viciſſitudes, and Accidents; that ſome of thoſe Parts, by their continual Motions, could chance to be diſordered, by the Intervention of ſome heterogeneous Bodies, and perhaps rendered entirely uſeleſs, or incapable of performing any longer their reſpective Functions; that divine and skilful Architect had precautioned himſelf againſt thoſe Inconveniencies, by eſtabliſhing ſuch a Correſpondence between every Part of that grand Machine, as to render one capable of ſupplying the Place of the other, in caſe it ſhould be rendered uſeleſs, or incapable of performing its Functions. That our ſuperior Faculties, placed by the ſame *Artiſt*, as in the Center of the Machine, and as a Maſter-ſpring to the whole, being perfectly acquainted with the different Operations of every Part, (ſince it influences each of them, and ſets them all to work) by a certain Caprice common to all great Maſters in their Art, was pleaſed to make one Part (often with an abſolute Neceſſity) perform the Functions of another. For Example, in Love Intrigues, wherein the Secret quickens the Taſte, and ſharpens the Appetite, when the Tongue ſhould, according to its natural Functions, interpret the Sentiments of the Heart; the Soul, on the contrary, directs thoſe animal Spirits deſigned for the Motion of the Tongue, on thoſe Occaſions, to the Eyes, and the Muſcles of the Face. So that thoſe Spirits which ſhould have been directed, perhaps, toward moving the Tongue to expreſs Sorrow, and Diſappointment in Love, by a contrary Direction of the magnetick Virtue of the Soul, glide ſlowly through the Optick Nerves, and make a languiſhing Eye expreſs more Sorrow in a Moment, than the Tongue could have done in a tedious Diſcourſe; at the ſame Time, Part of the Spirits which ſhould be directed to the Muſcles of the Face; for their natural Motion being intercepted, they ſuffer a ſenſible Alteration in their Functions, and, by a ſort of Convulſion, give a ſtill greater Energy to the Language of the Eyes. But if, on the contrary, 'tis to expreſs a kind of Satisfaction, then there is a total Direction of all the Spirits to all the Organs, through which they flow with ſuch Impetuoſity, that it ſeems as if they would force the Limits preſcribed to them by Nature: The Eyes ſparkle with ſuch Vivacity and Fire, as if the whole *Orbit* was threatened with an Incendy. The Muſcles of the Face are not only reſtored to their former Form, but have even a Superabundance of Spirits, which heighten the Agreement of the Face, or add a new Luſtre to its Beauty. The Tongue it ſelf, through the Petulancy of the Spirits it is agitated with, can ſcarcely keep within Bounds, and ſeem impatient to utter what the Faculties of the Soul have not digeſted for her; ſhe moves, even makes a ſort of confuſed Sound, and would ſpeak, if ſhe knew what.

The ſame Thing happens, though in a different Manner, in an Exceſs of Rage, or Fury. For in one of Satisfaction and Pleaſure, let the Spirits flow with ever ſo great an Impetuoſity, as ſuch Exceſs has nothing oppoſite to Nature, but, on the contrary, flatters all the ſenſitive Faculties, all the organical Parts dilate themſelves as in Concert, to render the Circulation of the Spirits free and eaſy; which thereby roll, without Obſtruction, through their reſpective Channels. But in an Exceſs of Rage, the too great Impetuoſity of the Spirits, directed all on a ſudden, and without the neceſſary Meaſures taken by the directive Faculties to expreſs Joy or Satisfaction, cauſes a preternatural Confuſion among them, and making them miſtake their proper Organs, they meet in every one of them ſuch Obſtructions, occaſioned by the Configuration of the Pores, not appropriated to them, as throws the whole Microcoſm into ſtrange Convulſions; as it appears at the different Changes of the Face, the *Sardick Laugh*, &c. This is my Opinion, or Syſtem, with Regard to *Phyſiognomy*.

The *Carteſians* expreſs themſelves in another Manner; for they ſay, that the animal Spirits moved in the Organ by an Object, continue their Motion to the Brain; whence that Motion is propagated to this or that particular Part of the Body as is moſt ſuitable to the Deſign of Nature; having firſt made a proper Alteration in the Face, by Means of its Nerves, eſpecially the *Pathetici*, and *Oculorum motorii*.

They pretend, that the Face here does the Office of a Dial-Plate; the Wheels and Springs within-ſide the Machine actuating its Muſcles, ſhew what is next to be expected from the ſtriking Part. Not that the Motion of the Spirits is continued all the Way by the Impreſſion of the Object; the Impreſſion probably terminates in the *Medulla* of the Brain, the common Fund of Spirits. The reſt Dr. *Gwither* imagines may be effected much after the ſame Manner as the Air is conveyed into the Pipes of an Organ, which being uncovered, the Air ruſhes in, and when the Keys are let go, ſtopped again.

Now if by repeated Acts, or the frequent entertaining of a favourite Paſſion, or Vice, which natural Temperament has hurried, or Cuſtom dragged one to; the Face is often put in that Poſture which attends ſuch Acts; the animal Spirits will make ſuch patent Paſſage through the Nerves, (in which the Eſſence of Habit conſiſts) that the Face is ſometimes unalterably ſet in that Poſture. (as the *Indian* Religious are, by a long continued ſitting in ſtrange Poſtures in their Pagods) or at leaſt falls inſenſibly and mechanically into that Poſture, unleſs ſome preſent Object diſtorts it therefrom, or Diſſimulation hides it.

This Reaſoning, *Chambers* pretends, or ſome Body elſe for him, is confirmed by Obſervation: Thus, ſays he, we ſee great Drinkers, with Eyes generally fixed to the Noſe; the adducent Muſcles being oft employed to put them in that Poſture, in order to view the loved Liquor in the Glaſs, at the Time of drinking; whence thoſe Muſcles are alſo denominated *Bibitory Muſcles*.

Thus, alſo, laſcivious Perſons (continues the ſame Author) are remarkable for the *oculorum mobilis petulantia*, the roving Ogle of the Eye, as *Petronius* calls it. Hence we may account, concludes he, for the *Quaker*'s expecting Face waiting the Spirit; the melancholy Face of moſt Sectaries, the ſtudious Faces of Men of great Application of Mind, *&c.* and were our Obſervation a little more ſtrict and delicate, we might, doubtleſs, not only diſtinguiſh Habits and Tempers, but even Profeſſions. In Effect, does there need much Penetration, to diſtinguiſh the fierce Look of the Veteran Soldier, the contentious Look of the practiſed Pleader, the ſolemn Look of the Miniſter of State, *&c.*

I am of Mr. *Chambers*'s Mind, in this, that we might, by obſerving attentively the Lineaments of the Face of a Perſon, diſtinguiſh his Habits, Inclinations, Paſſions, *&c.* to which Obſervation, the Syſtem here by me eſtabliſhed, would be of very great Service; for the following Reaſons. 1. If a Perſon is ſubject but to few or no Paſſions, at leaſt to none of thoſe violent ones capable to diſtort the Muſcles of the Face; or if entirely actuated by Intereſt, or ſome other Conſideration, his Reaſon has ſuch Aſcendant over the inferior Faculties, as to hinder the animal Spirits, employed in their ſeveral Operations, from being directed otherwiſe than is agreeable to the juſt Harmony, Order, or Regularity, which ſhould ſubſiſt between the organick Parts; thoſe ſame Spirits being kept always regular in their Motion, keep alſo the Organs, through which they paſs, always in their ſame natural Situation, without Diſtortion, Contortion, or Intumeſcence; and if it ſhould ever happen ſome Effervеſcence, in thoſe Spirits, the *Habit*, which the Reaſon of that Perſon has contracted, by repeated Acts, of directing thoſe Spirits ſo as to keep him almoſt always

always in a certain Subordination among themſelves, would ſoon rectify the Miſtake: Therefore ſuch a momentaneous Diſorder could not be capable of making any Alteration in the Muſcles of the Face. Perſons thus qualified, and in Poſſeſſion of ſo excellent a *Magnet*, for the Direction of their Paſſions, have this excellent Advantage above all the reſt of the rational Beings, of being a ſort of *Enigma*, very difficult to be enucleated; and the moſt learned *Phyſiognomiſt* is often miſtaken in the Conjectures he forms of them. Though with a very ſerious Study, and a great deal of Application, it is not entirely impoſſible to make a juſt Difference between what's natural, and what's affected.

A Perſon who from the firſt Moment he has known that he had a ſuperior Faculty for the Direction of all the inferior ones, as well as of his Paſſions, has from that Moment made no other Uſe of that Faculty, than according to the Intentions of the Divine Architect of the whole Machine, to keep them in a juſt Subordination among themſelves, the Habit, which *repetitis Actibus comparatur*, that Perſon has contracted, of governing thus his Paſſions, as ſoon as he was ſenſible that he had any, having prevented the leaſt of thoſe Diſorders, which thoſe who follow a contrary Conduct are ſubject to, makes its outward Frame all of a Piece, and keeps always the ſame Serenity on his Face, and without ſhadowing the leaſt of its Lineaments. But if, on the contrary, that Perſon, for ſome private View, or Conſideration, and the better to impoſe on the Publick, affects only to have gained that Aſcendant over his Paſſions; the Violence which his Reaſon makes to herſelf, to direct the other Faculties, contrary to his Inclinations, and the great Diſſonance ſubſiſting between her and thoſe Faculties, appear in the Inequality of the Diſtribution of the Spirits, which gives a different Light to every Lineament of the Face, and makes the principal Organs faulter. For if a Portion of globulous Spirits, all homogeneous, is directed to the Tongue, in order to make it ſpeak fair and ſmooth; a larger Portion flowing naturally from the natural Affection of the Soul, and which are in ſuch abundance, as not to be reſtrained from flowing through the other Organs, are conveyed to the Eyes, wherein they cauſe a certain preternatural, and affected Leering, by the Difference ſubſiſting between them, that they contradict the Language of the Tongue. But if even the Tongue and the Eyes ſpeak in Concert, they are likewiſe contradicted by the Changes which the Diſtortion of the Muſcles of the Face cauſes in its Features and Lineaments. Thus we can eaſily diſcover the Sincerity of a true Friend, and the Hypocriſy and Falſhood of a diſguiſed, or hidden Foe. For the Sincerity of the Proteſtations of a true Friend, is not only evidenced by the Strength, Energy, and Fluidity of his Diſcourſe, but alſo in the Vivacity of his Eyes, whoſe Radiancy appears then in its greater Luſtre, without the leaſt Cloud or Shadow; and in the Serenity of his Face, without Contortions, Grimaces, or affected Smiles; while, on the contrary, an affected Friendſhip, or a hidden Foe, has all his Organs in Maſquerade, his Tongue being a falſe Interpreter of the real Sentiments of his Heart, utters an artful Speech, the leſs to be depended upon, becauſe the more ſtudied, and leſs natural; the Vivacity of his Eyes appears as in a Cloud, whoſe Opacity meets always thoſe of the Perſon he is perfidiouſly endeavouring to perſuade of his Friendſhip; and if by Chance they dart ſome Glances, reflecting on that Cloud, they are always oblique, and never in a direct Line. Several other Clouds of Malice, Spite, and ſometimes of Revenge, overcaſt, by Intervals, the affected Serenity of his Soul. This is the Difference I have made between the Countenance of a true Friend, and that of a diſguiſed Foe; though I would not have the Temerity to ſay, as *Chambers* does, that this is the Badge whereby the Sectaries of our Time (as he is pleaſed to call them) are diſtinguiſhed from the Orthodox; let it be granted, if he pleaſes, that a grave and modeſt Countenance is oftener affected among them than among other *Chriſtians*; but I utterly deny that they, oftener than others, employ it as a Maſk to Perfidy, and Deceit; nay, I have ſeldomer ſeen it applied to that Purpoſe among them, than among other *Chriſtians*; and for one falſe Friend among them, I have found twenty, in other *Chriſtian* Societies, even thoſe which boaſt moſt of Orthodoxy, and that hidden Enmity attended with more dangerous Conſequences. As for a *Politician*, or a Miniſter of State's Countenance, we need not take much Pains in ſtudying it; for beſides a certain affected Gravity, diſcernible enough of itſelf, 'tis very eaſy to know his Intentions, if we take this for an infallible Rule, that they are almoſt always contrary to his Words, and *vice verſa*.

The Fair Sex has alſo, of late Years, wore three Maſks; one to ſcreen their Complexion from the unfavourable Aſpects of the Seaſons; one to change or alter that Complexion; and the third to diſguiſe their Inclinations, and the real Sentiments of their Hearts. The firſt ſteals from us the Beauty of their Charms; the ſecond is employed as a Priſm, to repreſent them otherwiſe than they are in Reality; and the third is a ſort of *Bait*, to hook us in by falſe Appearances. Therefore to caution Mankind againſt the Illuſions and Deceits of this laſt Maſk, I'll make a kind of Diſſection (if I may uſe the Expreſſion) of all its Parts. It is very natural to the Fair Sex, and it has been almoſt always a conſtant Practice among them, when they firſt begin to think of ſetting to Auction a certain Merchandiſe, which they are never deſirous to keep long on their Hands, as ſoon as they are ſenſible that it is to be diſpoſed of, to give to it the beſt Gloſs they can, and to place it in ſuch a Light, as could hide all its Defects, and ſhew it only on the beſt Side; therefore their principal Care is, to hide thoſe Defects, if there are any, in the Pleats of the Face: And it is to be obſerved, that the greater the Defects are, the more Art is uſed to diſguiſe them, in which the Fair Sex has always been very expert. Therefore let us unfold theſe Pleats, and diſcover, if poſſible, all the Defects hidden in them.

It would be ridiculous to ſuppoſe that a Lady who conſults her own Advancement, or Intereſt, ſhould not take the neceſſary Precautions to diſguiſe her Merchandiſe, if bad, while ſhe is treating with a Merchant. For my Part, I'll always ſuſpect one who affects a Modeſty, an Evenneſs of Temper, a Complaiſance, or ſome other rare Perfection, to Exceſs; ſince when the Merchandiſe is ſold, and delivered, that fine Gloſs vaniſhes at once, and is infallibly changed into another Exceſs. An extraordinary innocent Look, frequent Bluſhes at every Word ſpoken, though with the greateſt Circumſpection, Glances accompanied with a Lear, a pretty long Noſe, a canting Tune in ſpeaking, an unſettled and grinning Countenance; are all indicative Signs of a Shrew, or of a Woman without Virtue, Prudence, Judgment, Conduct, Houſewifery, *&c.* born for the Plague of a Huſband, the Ruin of her Family, and the Scandal of her Sex. But, on the contrary, a Woman with an open, though modeſt Countenance, without Affectation, a natural Vivacity in her Eyes, without borrowed, or ſtudied Looks; a becoming Reſervedneſs, without Haughtineſs, and Inſolence; an engaging Voice, firm, and without whining, regular Features, *&c.* are almoſt always infallible Marks of a real Merit in the Fair Sex. But, however, all theſe Rules are not infallible; for they are as deficient, in ſeveral Particulars, as they are true in others: Therefore we can very well ſay, with *Tullius*, *Lib.* 1. *Epiſt. ad quintum fratrem*, *Epiſt.* 1. *Frons*, *oculi*, *vultus*, *perſæpe mentiuntur*, i. e. the Forehead, Eyes, and Face, very often lie.

METOPOSCOPY is no more than a Branch of *Phyſiognomy*, with this ſingle Difference, that *Metopoſcopy* is the Art of diſcovering the Temperament, Inclinations, and Manners of Perſons, by inſpecting the Lines of their Foreheads; while *Phyſiognomy* takes its

Conjectures from the whole Face, and even all Parts of the Body; but both the Body and the Branch are extremely precarious, not to say vain.

Coro Spontoni, who has wrote on the Subject of *Metoposcopy*, observes, that there are four principal Lines considered in the Forehead, each of which has its peculiar *Planet*. The first is the Line of *Saturn*, the second of *Jupiter*, &c.

For my Part, I am of Opinion, that it is almost impossible to be mistaken in the *Physiognomy* of a Person, especially when he speaks; for then, by observing attentively the Motion of his Eyes, if we find that they act in Concert with the Tongue, *i. e.* when it expresses Sorrow, or Affliction, the Eyes appear dull, heavy, and as in a Cloud; and, on the contrary, when it expresses Satisfaction, Pleasure, *&c.* the Eyes sparkle with a fiery Vivacity; such Person speaks the real Sentiments of his Heart, *&c.*

We'll conclude this Treatise, by observing, that *Judicial Astrology* is commonly said to have been invented in *Chaldæa*, and thence transmitted to the *Egyptians*, *Greeks*, and *Romans*. Though some will have it of *Egyptian* Origin, and ascribe the Invention to *Cham*. But we owe it to the *Arabs*. At *Rome* the People were so infatuated with it, that the *Astrologers*, or, as they were then called, the *Mathematicians*, maintained their Ground, in Spite of all the Edicts of the Emperors, as they do here, in Spite of the Acts of Parliament. The *Bramins*, who introduced, and practised this Art among the *Indians*, have hereby made themselves the Arbiters of good and evil Hours, which gives them a vast Authority; they are consulted as Oracles, and they have took Care never to sell their Answer but at a good Rate.

Here among us there is scarce a House where there are not two or three *Astrologers*, especially of the Female Kind, who are more careful to observe a lucky or unlucky Day, than to keep their Family in good Order; who study a Stranger at the Grate, the Motions of a Cat, the Howling of a Dog, the Death-Watch, the Itching of their Elbow, Knee, Feet, or of something else, with a greater Attention than the Education of their Family, and how to please their Husbands; who are two or three Hours poring over an empty Tea-Cup, to see if they could discover in it another Husband, who could keep a Coach and Six (though the first is yet living and in good Heath) or if a secret Intrigue is to succeed according to Expectation, or a Love-Letter to be answered, and an Infinity of other ignorant, stupid, scandalous, ridiculous, and unchristian like Observations, when she should be otherwise employed. These Errors and scandalous Practices proceed from a vitiated Education; and in some Families this Sort of *Astrology*, Divination, or what you'll be pleased to call it, is a Kind of hereditary Distemper, which circulates with the Blood throughout whole Generations, and has its first Origin from the *Auguries* of the *Pagans*, which were Presages taken concerning Futurity, from Birds, Beasts, and the Appearances of the Heavens.

Varro distinguishes four Species of *Augury* according to the four Elements. *Pyromancy*, or *Augury* by the *Fire*; *Aëromancy*, or *Augury* by the *Air*; *Hydromancy*, or *Augury* by the *Water*; and *Geomancy*, or *Augury* by the *Earth*.

Pyromancy. The Antients imagined they could foretel Futurity by inspecting Fire and Flame; to this End they considered its Direction, or which Way it turned, (which answers very well to the Prognostications we draw from the Manner our Fire burns). Sometimes they added other Matters to the Fire, *e. gr.* a Vessel full of Urine, with its Neck bound about with Wool, watching narrowly on which Side it bursts, and thence taking their *Augury*. Sometimes they threw Pitch on it, and if it took Fire immediately, esteemed it a good *Augury*.

Hydromancy. *Varro* mentions the *Persians* as the first Inventors of *Hydromancy*, adding that *Numa Pompilius* and *Pythagoras* made Use thereof.

Geomancy, is performed by means of a Number of little Points or Dots made on Paper at Random; and considering the various Lines and Figures, which those Points present; and thence forming a Judgment of Futurity, or deciding any Question proposed.

Polydore Virgil, *lib.* 1. *c.* 23. *de Invent. Rer.* defines *Geomancy* a Kind of Divination performed by Means of Clefts or Chinks made in the Ground, and takes the *Persian Magi* to have been the Inventors thereof.

The particular Branches of *Augury*, are *Alectoromancy*, *Anthropomancy*, *Belomancy*, *Catoptromancy*, *Capnomancy*, *Gastromancy*, *Aruspicina*, *Libanomancy*, *Lecanomancy*, &c.

Alectoromancy, from αλεκτωρ, a Cock, and μαντεια, Divination, is an antient Kind of *Divination*, performed by Means of a Cock.

This Art was in Use among the *Greeks*, and the usual Manner of it was this. A Circle was made on the Ground, and divided into twenty four equal Portions or Spaces; in each of which Spaces was written one of the Letters of the Alphabet, and upon each of these Letters was laid a Grain of Wheat. This done, a Cock was turned loose in the Circle, and careful Observation made of the Grains he pecked. The Letters corresponding to those Grains were afterwards formed into a Word; which Word was to be the Answer desired.

It was thus that *Libanius* and *Jamblichus* sought who should succeed the Emperor *Valens*; and the Cock answering to the Spaces ΘΕΟΔ, they concluded upon *Theodore*, but by a Mistake instead of *Theodosius*.

Anthropomancy, from ανθρωπος, Man, and μαντεια, Divination, is a Method of Divination performed by inspecting the *Viscera* of a Person deceased.

Belomancy, from βελος, Arrow, and μαντεια, Divination, is a Kind of Divination, by Means of Arrows practised in the East, but chiefly among the *Arabians*.

Belomancy has been performed in different Manners: One was to mark a Parcel of Arrows, and put eleven or more of them into a Bag; these were afterwards drawn out, and according as they were marked, or not, they judged of future Events.

Another Way was to have three Arrows, upon one of which was wrote, *God orders it me*; upon another *God forbids it me*; and upon the third nothing at all. These were put into a Quiver, out of which they drew one of the three at Random; if it happened to be that with the first Inscription, the Thing they consulted about was to be done; if it chanced to be that with the second Inscription, it was let alone; but if it proved that without Inscription, they drew over again.

Belomancy is an antient Practice, and probably that which *Ezekiel* mentions, *c.* xxi. 21. at least St. *Jerom* understands it so, and observes that the Practice was frequent among the *Assyrians* and *Babylonians*. Something like it is also mentioned in *Hosea*, c. iv. only that *Staves* are there mentioned instead of Arrows, which is rather *Rhabdomancy* than *Belomancy*. *Grotius* as well as St. *Jerom* confounds the two together, and shews that it prevailed much among the *Magi*, *Chaldeans*, and *Scythians*; whence it passed to the *Sclavonians*, and thence to the *Germans*, whom *Tacitus* observes to make Use of it.

Catoptromancy, from κατοπτρον, *Speculum*, and μαντεια, *Divinatio*, is a Kind of Divination among the Antients; so called, because consisting in the Application of a Mirrour.

Pausanias says, it was in Use among the *Achaians*, where those who were sick, and in Danger of Death, let down a Mirrour, or Looking-Glass, fastened by a Thread into a Fountain before the Temple of *Ceres*; then looking in the Glass, if they saw a ghastly, disfigured Face, they took it as a sure Sign of Death: On the contrary, if the Face appeared fresh


System of Ptolemy of Copernicus of
Prime Mob
2d Crystall
1st Crystall
Fixed Stars
Saturn
Jupiter
Mars
Sun
Venus
Mercury
Moon
fig. 9.
fig 7
fig 8
fig 4
fig 5
fig 6
Moon.
Sphere.
Globe
Gunter's Quadrant.
Moon
Moon
Moon

B. Cole Sculp.

freſh and healthy, it was a Token of Recovery. Sometimes Glaſſes were uſed without Water, and the Images of Things future repreſented in them.

CAPNOMANCY, from καπνος, Smoak, and μαντεια, Divination, is a Kind of Divination by means of Smoke, uſed by the Antients in their Sacrifices. The Rule was, when the Smoke was thin, and light, and roſe ſtrait up, it was a good Omen; if the contrary it was an ill one.

There was another Species of *Capnomancy* conſiſting in the Obſervation of the Smoke riſing from Poppy, or Jeſſamin Seed, caſt upon light Coals.

GASTROMANCY, from γαστηρ, Belly, and μαντεια, Divination, is a Kind of Divination practiſed among the Antients, by Means of Words coming, or ſeeming to come out of the Belly.

There is another Kind of Divination called by the ſame Name, *Gaſtromancy*, which is performed by means of Glaſſes, or other round, tranſparent Veſſels; at the Bottom whereof certain Figures appear by Magick Art. It is thus called, by Reaſon the Figures appear, as in the Belly of the Veſſels.

ARUSPICINA, is the Doctrine or Diſcipline of the *Aruſpices*.

The *Aruſpices* were an Order of Prieſts among the antient *Romans*, who foretold Things to come, chiefly by inſpecting the Entrails of Beaſts killed in Sacrifice. The Antients were ſo fond of this Art, that nothing of publick or private Affairs ſhould be tranſacted without it. In *Aruſpicina* it was obſerved whether the Beaſt came willingly to the Altar or not. Whether the Entrails were of a natural Colour, and not ulcerated, or whether any Part were defective or wanting; and when *Auguſtus* found two Galls in his Sacrifice, the Credulity of the People concluded a Hope of Peace with *Anthony*, and the Amity of Perſons in Choler with each other.

Cato, who was himſelf an *Augur*, had ſo bad an Opinion of the Solidity of the *Aruſpicina*, that he uſed to ſay he wondered how one *Aruſpex* could look at another without laughing in his Face.

The *Augurs* made a College of Community, which at firſt conſiſted of three Perſons (one for each Tribe); then of four (when *Servius Tullius* encreaſed the Tribes to that Number;) then of nine (four of them Patricians, and five Plebeians:) *Laſtly*, *Sylla* made the Number fifteen. They bore an augural Staff or Wand, called *Lituus*; as the Enſign of their Office and Authority. No Affair of Moment, as I have already obſerved could be reſolved on, without firſt conſulting them; and their Advice, be what it would, was, by a Decree of the Senate, appointed to be exactly and religiouſly obſerved; but in all Appearance, their Advice was always agreeable to the Sentiments of the Senate, elſe I am of Opinion, that he had made no Scruple, to follow a contrary one, or elſe, which is the more likely, thoſe Advices were dictated by the Senate, and that Mummery of conſulting the *Augurs* was only to render his Decrees more ſolemn to the People, who are always eaſily impoſed upon by an outward Shew of Religion; for it is not reaſonable to ſuppoſe, that the moſt ſenſible Part of that warlike and judicious Nation could have been thus led by the Noſe, or believed blindly all their ſuperſtitious Ceremonies, and the pious Frauds and Impoſtures, invented with no other Deſign than to abuſe the Ignorance, and too great Credulity of the Vulgar.

ASTRONOMY.

ASTRONOMY, from αστηρ, Star, and νομος, Law, Rule, is the Doctrine of the Heavens, and the *Phænomena* thereof.

HEAVEN is that immenſe Region, wherein the Stars, Planets, and Comets are diſpoſed; but *Heaven* is more particularly uſed in this Place, for an *Orb* or circular Region of the Ætherial *Heaven*.

The antient *Aſtronomers* aſſumed as many different *Heavens* as they obſerved different Motions therein. Theſe they ſuppoſed all to be ſolid, as thinking they could no otherwiſe ſuſtain the Bodies fixed in them; and ſpherical, as being the moſt proper Form for Motion. Thus we had ſeven *Heavens* for the ſeven *Planets*, *viz.* the *Heavens* of the *Moon*, *Mercury*, *Venus*, the *Sun*, *Mars*, *Jupiter*, and *Saturn*. The eighth was for the fixed Stars, which they particularly called the *Firmament*. *Ptolemy* added a ninth, (as we'll ſee when we come to examine his Hypotheſis) which he called the *Primum Mobile*. After him two cryſtalline *Heavens* were added by King *Alphonſus*, to account for ſome Irregularities in the Motions of the other *Heavens*; and *laſtly* an *Empyrean Heaven* was drawn over the whole; for the Reſidence of the Deity, which made the Number twelve.

The *Cryſtalline Heavens* were not ſuppoſed to have any Stars fixed in them: They encompaſſed the inferior, ſtarry, and Planetary *Heavens*, and communicated their Motion to them. The firſt ſerved to account for that ſlow Motion of the fixed Stars, whereby they advanced a Degree Eaſtward in 70 Years; whence the Proceſſion of the *Equinox*. The ſecond was to ſolve the Motions of Libration, or Trepidation. But others admitted many more *Heavens*, according as their different Views and Hypotheſes required. *Eudoxus* ſuppoſed 23, *Calippus* 30, *Regiomontanus* 33, *Ariſtotle* 47, and *Fracaſtor* no leſs than 70.

We may add, that the *Aſtronomers* did not much concern themſelves whether the *Heavens* they thus allowed of were real or not, provided they ſerved a Purpoſe in accounting for any of the celeſtial Motions, and agreed with the *Phænomena*. Among the other Reveries of the *Rabbins* contained in the *Talmud*, we find it aſſerted, that there is a Place where the *Heavens* and Earth join together; that *Rabbi Barchana* going thither, laid his Hat on the Window of *Heaven*; and that going to take it again immediately after, it was gone, the *Heavens* having carried it off; ſo that he muſt wait for a Revolution of the Orbs to bring it to its Place again.

The *Heavens* may be conſidered two Ways; either as they appear to the naked Senſe, or as they are diſcovered by the Underſtanding; and hence *Aſtronomy* is divided into two Branches, *Spherical* and *Theorical*.

SPHERICAL *Aſtronomy*, is that Part of *Aſtronomy* which conſiders the Univerſe, ſuch as it appears to the Eye. Under *Spherical Aſtronomy*, then come all the *Phænomena* and Appearances of the *Heavens* and heavenly Bodies, ſuch as we perceive them; without any Inquiry into the Reaſon, the Theory, or the Truth thereof. In this Kind of *Aſtronomy*, the World is conceived to be a Concave, *ſpherical* Surface, in whoſe Center is the Earth, or rather the Eye, about which the viſible Frame revolves, with Stars and Planets fixed in the Circumference thereof, and on this Suppoſition all the *Phænomena* are determined.

'Tis called *ſpherical Aſtronomy*, from the *Sphere*, the Subject thereof; and which is that concave *Orb* or Expanſe, which inveſts our Globe, and in which the heavenly Bodies, Sun, Stars, Planets, and Comets appear to be fixed at an equal Diſtance from the Eye.

This *Sphere* (as it includes the fixed Stars, whence we alſo call it the *Sphere* of the fixed Stars) is vaſtly great. The Diameter of the Earth's *Orbit* is ſo ſmall in Reſpect of the Diameter hereof, that the Center of the *Sphere* is not ſenſibly changed by any Alteration of the Spectator's Place in the ſeveral Parts of the *Orbit*:

Orbit: But ſtill, in all the Points of the Earth's Surface, and at all Times, the Inhabitants have the ſame Appearance of the *Sphere*; that is, the fixed Stars ſeem to poſſeſs the ſame Points in the Surface of the *Sphere*. For our Way of judging of the Places, &c. of the Stars, is to conceive right Lines drawn from the Eye, or the Center of the Earth, through the Centers of the Stars, and continued thence, till they cut the aforeſaid *Sphere*; the Points where theſe Lines terminate therein, are the apparent Places of thoſe Stars.

The better to determine the Places of the heavenly Bodies in the *Sphere*, ſeveral Circles are imagined to be deſcribed on the Surface thereof; hence called Circles of the *Sphere*; which are ten in Number, *viz.* ſix greater, and four leſſer.

The greater are, the (a) *Horizon*, (b) *Meridian*, (c) *Equator*, (d) *Ecliptick*, (e) the *Colures*, and the (f) *Azimuths*; which are all equal, and cut each other into equal Portions, or Semicircles, and cut the whole *Sphere* into two equal Parts, or *Hemiſpheres*, having their Center in the Center thereof.

The *leſſer Circles* are, the two (g) *Tropicks*, and the two (h) *Polars*; which divide the *Sphere* into two unequal Parts.

Of the four *greater Circles*, there are three, *viz.* the *Horizon*, *Meridian*, and *Equator*, whoſe Poles, or the Points they are underſtood to be drawn or deſcribed from, are of very great Conſequence in the *Sphere*, and are called *Cardinal Points*. The two firſt are the *Arctick*, or *North Pole*, which is that viſible to us; and its oppoſite the *Antarctick*, or *South Pole*. Theſe two Points, each 90 Degrees diſtant from the *Equator*, are called, by way of Excellence, the *Poles of the World*, and are the two Extremities of the *Axis* whereon the *Sphere* revolves; whence their Name πολος, from πολειν, *vertere*, to turn. The next to theſe, are the *Zenith* and *Nadir*, called *vertical Points*; one directly over our Heads, which is the *Zenith*; and the other, *viz.* the *Nadir*, directly under our Feet.

The ZENITH, is a Point in the Surface of the *Sphere*, from which a right Line, drawn through the Spectator's Head, paſſes through the Center of the Earth. Hence there are as many *Zeniths* as there are different Places on the Earth where the Heavens may be ſeen; and upon the changing our Place, we alſo change our *Zenith*.

The NADIR, is that Point diametrically oppoſite to the *Zenith*. The *Nadir* is the *Zenith* to our *Antipodes*; as our *Zenith* is the *Nadir* to them. Theſe two Points are alſo the *Poles* of the *Horizon*.

The other *Points*, are the EQUINOCTIAL, wherein the *Ecliptick* and *Equator* interſect; particularly that whence the *Sun* aſcends towards the *North Pole*, is called the *vernal Point*; and that by which he deſcends to the *South Pole*, the *autumnal Point*. Which Points are conſidered as the *Poles* of the *Meridian*.

Having conſidered theſe *Points*, we'll proceed to the *Examen* of the ſeveral different Circles which we imagine to compoſe the *Sphere*, beginning by the greater, and of them, by the *Horizon*.

The HORIZON, (in *Greek* ὁριζων, from ὁριζω, *termino*, *definio*; and in *Latin*, *finitor*, finiſher) is a *Circle*, which when, from an even and open Place, we turn our Eyes round about us, terminates every where our Sight, and ſeems to join the Heavens and Earth together; and ſerves, as I have already obſerved, to divide the *Sphere*, or the World, into two equal Parts, or Hemiſpheres, *viz.* ſuperior, and inferior; and is ſuppoſed to be deſcribed from the two Points oppoſite to us, *i. e.* the *Zenith* and *Nadir*: So that when we change Place, we alſo change the *Horizon*, becauſe the *Zenith* and *Nadir* are changed.

The MERIDIAN (the ſecond great *Circle* in Order) is a *Circle* of the *Sphere*, paſſing through the *Zenith*, *Nadir*, and *Poles* of the World, and dividing the *Sphere* into two *Hemiſpheres*, the one eaſtern, and the other weſtern.

It is called *Meridian*, from the *Latin*, *meridies*, Noon, or Mid-day; by reaſon when the *Sun* is in this *Circle*, the Day is half ſpent, in thoſe Places ſituate under it; the Sun being then at an equal Diſtance from the *Orient* and *Occident*, or from the *Eaſt* and *Weſt*.

The EQUATOR, (the third of the great *Circles* we have imagined) is a *Circle* of the *Sphere* equally diſtant from the two *Poles* of the World, or having the ſame *Poles* with thoſe of the World. It is called *Equator*, by reaſon when the *Sun* is therein, the Days and Nights are equal; which happens twice a Year, *viz.* according to the *New Style*, about the twentieth Day of *March*, and the twenty-third of *September*; whence, alſo, it is called *Equinoctial*.

Every Point of the *Equator* is a Quadrant's Diſtance from the *Poles* of the World; whence it follows, that the *Equator* divides the *Sphere* into two Hemiſpheres, in one of which is the northern, and in the other the ſouthern *Pole*; which are both joined by an imaginary Line, called the *Axis* of the World.

The *Equator*, by its Converſion from Eaſt to Weſt, meaſures the Day. For the *Equator* being cut into 360 Parts, or Degrees, and the Day divided into 24 Hours, 15 of thoſe Degrees are elapſed in the Space of an Hour. Hence we have frequent Occaſion for the Converſion of Degrees of the *Equator* into Time; and, again, for the Re-converſion of Parts of Time into Parts of the *Equator*. For Performance whereof, we refer to our Treatiſe of *Geography*.

We muſt obſerve here, that from the various Poſition of the *Equator* to the *Horizon*, we uſe to diſtinguiſh a triple Situation of the *Sphere*. For thoſe are ſaid to have the *Sphere direct*, who dwell under the *Equator*; becauſe the *Equator* cuts their *Horizon* at right Angles. On the contrary, the *Sphere* is *oblique* to thoſe who inhabit the Parts between the *Equator* and the *Poles* of the World; becauſe the *Equator* cuts their *Horizon* in an oblique Manner. And thoſe who are placed under the *Poles*, have the *Sphere* parallel; becauſe the *Equator* is parallel to their *Horizon*; or rather, is the ſame as their *Horizon*, and is parallel to the *Tropicks* and *Poles*.

Between theſe four great *Circles*, is a *Faſcia*, or broad *Circle*, called ZODIACK, whoſe Middle is in the *Ecliptick*, and its Extremes two *Circles* parallel thereto, at ſuch a Diſtance from it, as to bound or comprehend the Excurſions of the Sun and Planets. It is called *Zodiack*, from the *Greek* ζωον, an Animal; by reaſon of the Conſtellations therein. Others derive it from ζωη, Life; from an Opinion that the Planets have a great Influence on animal Life.

The *Sun* never deviates from the Middle of the *Zodiack*, *i. e.* from the *Ecliptick*, (which is a Line drawn in the Middle of the *Zodiack*) the *Planets* all do it, more or leſs. Their greateſt Deviations, called *Latitudes*, are the Meaſure of the Breadth of the *Zodiack*; which is broader, or narrower, as the greateſt Latitude of the *Planets* is made more or leſs. Accordingly, ſome make it 16, ſome 18, and ſome 20 Degrees broad.

The ZODIAC cutting the *Equator* obliquely, makes an Angle therewith of 23 Degrees and an half; or, more preciſely, of 23° 29′, which is what we call the *Obliquity of the Zodiack*, and is the Sun's greateſt Declination.

The *Zodiac* is divided into twelve Portions, called *Signs*; and thoſe Diviſions, or *Signs*, are denominated from the Conſtellations which antiently poſſeſſed each Part. *Auſonius* has comprehended the Names of thoſe *Signs*, in the two following Verſes:

Sunt Aries, Taurus, Gemini, Cancer, Leo, Virgo,
Libraque, Scorpius, Arcitenens, Caper, Amphora,
Piſces.

But the *Zodiack* being immoveable, and the Stars having a Motion from Weſt to Eaſt, thoſe Conſtellations no longer correſpond to their proper *Signs*; whence ariſes what we call the *Preceſſion* of the Equinoxes, a Term applied to the Equinoxes, which, by a very

very flow, insensible Motion, change their Places, going backwards, or westward, *i. e. in antecedentia*, as Astronomers call it, or contrary to the Order of the *Signs*.

When a Star, therefore, is said to be in such a *Sign* of the *Zodiack*, it is not to be understood of that *Sign*, or *Constellation* of the Firmament; but only of that twelfth Part of the *Zodiack*, or *dodecatemory* thereof.

Cassini has also observed a Track in the Heavens, within whose Bounds most of the Comets, though not all of them, are observed to keep, which, for this Reason, he calls the *Zodiack* of the Comets. This he makes as broad as the other *Zodiack*, and marks it with *Signs*, and *Constellations*, like that; as *Antinous*, *Pegasus*, *Andromeda*, *Taurus*, *Orion*, the *lesser Dog*, *Hydra*, the *Centaur*, *Scorpion*, and *Sagittary*.

The Points of the *Ecliptick* whereby the Sun's Ascent above the *Equator*, and its Descent below it, are terminated, are called *solstitial Points*. The first Point, which is the Beginning of the first Degree of *Cancer*, is called the *Æstival*, or *Summer Point*; and the latter, which is in the Beginning of the first Point of *Capricorn*, the *Winter Point*: Therefore the Time when the Sun is in one of the *solstitial Points*, that is, when he is at his greatest Distance from the *Equator*, which is 23 Degrees and an half, is called *Solstice*, because he then appears to *stand still*, and not to change his Place in the Degrees of the *Zodiack*, any Way; not that he does not follow, then, his usual Course from East to West, but because he is no longer perceived to advance towards the *Septentrion*, or *Meridian*; an Appearance owing to the Obliquity of our *Sphere*, and which those who live under the *Equator* are Strangers to.

The SOLSTICES are two in each Year, the *Æstival*, or *Summer Solstice*; and the *Hyemal*, or *Winter Solstice*. The *Summer Solstice* is when the Sun is in the *Tropick*, which is on the 11th of *June*; when he makes the longest Day. The *Winter Solstice* is when he enters the first Degree of *Capricorn*, which is on the 11th of *December*; when he begins to return towards us, and makes the shortest Day.

This is to be understood as in our northern Hemisphere; for in the southern, the Sun's Entrance into *Capricorn* makes the *Summer Solstice*; and that into *Cancer* the *Winter Solstice*.

Besides these two *solstitial Points* placed in the Beginning of *Cancer* and *Capricorn*, there are two others in the Beginning of *Aries* and *Libra*, called *equinoctial*; which are the two Points wherein the *Equator* and *Ecliptick* intersect each other. That in the first Point of *Aries* is called the *vernal*; and the other, in the first Point of *Libra*, the *autumnal Point*. In these four Points, *viz.* the two *solstitial*, and the two *equinoctial*, the four Seasons of the Year begin; *viz.* the *Spring*, the *Summer*, the *Autumn*, and the *Winter*.

Through these Points passes two Circles, the last of the greater ones, called COLURES, from κολος, *mutilus*, or *truncatus*, and ὐρα, Tail, *q. d.* appearing with the Tail cut off; because never seen entire above the Horizon. One of them, because passing through the *solstitial* Point of the *Ecliptick*, is called *solstitial Colure*; and the other *equinoctial*, because it passes through the *equinoctial* Point. These two *Colures* are imagined to intersect each other at right Angles, in the Poles of the World.

The four lesser Circles, which divide the *Sphere* into two unequal Segments, are the two *Tropicks*, and the two *Polars*.

The TROPICKS, iK, are two Circles parallel to the *Equator*, at such Distance therefrom, as is equal to the Sun's greatest Recess from the *Equator* towards the Poles; or to the Sun's greatest Declination; or the Obliquity of the *Ecliptick*. Of the two *Tropicks*, that drawn through the Beginning of *Cancer* is called the *Tropick of Cancer*; and that through the Beginning of *Capricorn*, the *Tropick of Capricorn*.

They have their Names from the *Greek* τροπη, turn, Conversion; as being the Limits of the Sun's Way, or Declination towards the North and South; so that when the Sun is arrived at either of them, he turns the other Way.

Hence, 1. Since the Declination of the *Ecliptick* is the Arch B D, A C will be the Distance of the *Tropicks*; which is double the greatest Declination.

2. Wherefore, if the Sun's Meridian Altitude be observed, both in the Winter and Summer *Solstice*, and the latter be substracted from the former, the Remainder will be the Distance of the *Tropicks*; half whereof is the greatest Declination of the *Ecliptick*.

The POLAR CIRCLES, p q, are two lesser Circles of the *Sphere*, parallel to the *Equator*, at the Distance of 23 Degrees from each Pole, serving to mark the Beginning of the Frigid Zones. The *Polar Circles* are particularly denominated from their respective neighbouring Poles, the *Arctick* and *Antarctick*.

These several *Circles* are represented in their natural Order, in an artificial *Sphere* called *Armillary*, from its consisting of a Number of *Fasciæ*, or Rings of Brass, or other Matter; called, by the *Latins*, *Armillæ*, from their resembling of Bracelets, or Rings for the Arms. This *Armillary Sphere* serves to give an Idea of the Office and Position of each Circle thereof, and to solve various Problems relating thereto.

Armillary Spheres are of different Kinds, with regard to the Position of the Earth therein; whence they become distinguished into *Ptolemaic* and *Copernican Spheres*; in the first whereof the Earth is in the Center, and in the latter near the Circumference, according to the Position which that Planet obtains in those Systems.

The *Ptolemaic Sphere*, is that commonly in Use. In the Middle, upon the *Axis* of the *Sphere*, is a Ball T, representing the Earth, on whose Surface are the Circles, *&c.* of the Earth. The *Sphere* is made to revolve about the said *Axis*, which remains at Rest; by which Means the Sun's diurnal and annual Course about the Earth, are represented, according to the *Ptolemaick Hypothesis*: And even, by Means whereof, all Problems, relating to the *Phænomena* of the Sun and Earth, are solved as upon the Celestial Globe, and after the same Manner.

The *Copernican Sphere*, is very different from the *Ptolemaic*, both in its Constitution and Use; and more intricate in both. Indeed the Instrument is in the Hands of so few People, and its Use so inconsiderable, except what we have in the more common Instruments, particularly the *Globe*, and *Ptolemaic Sphere*, that we shall be easily excused the not filling up Room with any Description thereof.

Having thus far proceeded on the Doctrine of the *Sphere*, and mentioned here the *Ptolemaic* and *Copernican Spheres*; I judge it proper, for the Instruction of those who have not the least Tincture of *Astronomy*, and to leave nothing untouched which could contribute toward the Elucidation of all, and every one of the Problems of that divine Science, to attempt in this Place the several Systems, or Hypotheses, of the World, but more particularly, those of *Ptolemy*, *Copernicus*, and *Tycho Brahe*; beginning with the Definition of *System*.

SYSTEM, in *Astronomy*, denotes an *Hypothesis*, or Supposition, of a certain Order, and Arrangement of the several Parts of the Universe; whereby *Astronomers* explain all the *Phænomena*, or Appearances of the heavenly Bodies, their Motions, Changes, *&c.* *System* and *Hypothesis* have much the same Signification; unless, perhaps, *Hypothesis* be a more particular *System*; and *System* a more general *Hypothesis*.

Some late Authors, indeed, furnish a further Distinction: An *Hypothesis*, say they, is a mere Supposition, or Fiction; founded rather on Imagination, than Reason: A *System* is only built on the firmest Ground, and raised by the severest Rules: It is founded on *astronomical* Observations, and physical Causes, and confirmed by geometrical Demonstrations.

The moſt celebrated *Syſtems* of the World are, as I have already obſerved, the *Ptolemaick*, the *Copernican*, and the *Tychonick*; the Œconomy of each whereof is as follows:

PTOLEMAICK *Syſtem* places the Earth at Reſt in the Center of the Univerſe; and makes the Heavens, ſolid and uncorruptible, revolve round the ſame from *Eaſt* to *Weſt*, and carry all the heavenly Bodies, Stars, and Planets along with them.

It is called *Ptolemaick Syſtem*, not becauſe *Ptolemy* is the Author of it, but becauſe he has perfected it; ſince the *Egyptians* and *Chaldeans*, two Nations, much addicted to *Aſtronomy*, had, long before him, placed the Earth likewiſe at Reſt in the Center of the Univerſe; and imagining they had obſerved eight different Motions in the *Heavens*, *viz.* the Motion of the fixed Stars from *Eaſt* to *Weſt* in 24 Hours; and the Motion of the ſeven Planets from *Weſt* to *Eaſt*, they thought fit to diſtinguiſh eight different heavenly *Orbs*, which moved round the Earth, *viz.* the *Orb* of the fixed Stars, and ſeven *Orbs* for the ſeven Planets.

Plato, *Ariſtotle*, *Eudoxus*, *Calippus*, and almoſt all the moſt famous *Aſtronomers*, who preceeded *Ptolemy*, followed this Syſtem, and were pleaſed to call the *Orb* or *Heaven* of the fixed Stars *primum mobile*, under the Suppoſition, that by its Motion the inferior Orbs of the Planets were carried in the Space of 24, or rather 23 Hours, 56 Minutes, 4 Seconds from *Eaſt* to *Weſt*.

They had alſo appointed a certain Period of Time for the Planets to perfect their Courſe from *Weſt* to *Eaſt*, each in its reſpective Orb, againſt the Motion of the *Primum Mobile*; viz. *Saturn* accompliſhed his in almoſt thirty Years, *Jupiter* in twelve, *Mars* in two, the *Sun* in one, *Venus* in a little more than ſeven Months, *Mercury* in three Months, and the *Moon* in one Month.

The *Aſtronomers*, who ſucceeded theſe, particularly *Arſatilis* and *Timocharis* (who flouriſhed at *Alexandria* about 330 Years before the Birth of Chriſt,) having compared their own Obſervations, with thoſe of their Predeceſſors imagined to have diſcovered in the fix'd Stars, a Motion from *Weſt* to *Eaſt*; confirmed therein, by pretending to have obſerved, that the firſt and the moſt occidental or weſtward Star in the Horn of *Aries*, which the antient *Aſtronomers* had diſcovered in the greater Circle of Latitude, paſſing through the Poles of the Zodiac and the vernal equinoctial Point, had, according to the Order of the *Signs*, or by Conſequence, advanced further with the reſt of the Stars, which was confirmed two hundred Years afterwards by *Hypparchus*, and alſo by *Ptolemy* himſelf, in the Year of *Chriſt*, 130; therefore above the Firmament, or the *Heaven* of the Stars, which *Ptolemy* ſuppoſed to be carried round its Orb, by its proper Motion, in the Space of 36000 Years, they thought proper to imagine a ninth *Heaven*, as a *primum mobile*, which, in the Space of 24 Hours, could carry the other *Heavens* along with him, from *Eaſt* to *Weſt*; which Opinion was defended afterwards by *Albategnius*, *Alphraganus*, *John de Sacroboſco* and others; but in the thirteenth Century *Thebitius* and *Alphonſus*, King of *Caſtille*; and in the fourteenth, *George Puerbach*, and *John Regiomontanus* diſcovered, or rather thought to have diſcovered in the Firmament or eighth *Sphere*, a third Motion, which they called Trepidation.

The Sectators of King *Alphonſus* conceived three Motions in the eighth *Sphere*; the firſt they called *Raptus*, whereby the eighth *Sphere*, together with the reſt of the inferior *Orbs*, were carried by the *Primum Mobile*, in the Space of 24 Hours, from *Eaſt* to *Weſt*. They were pleaſed to give it a ſecond Motion which they called *Proper*, whereby, in the Space of 49000 Years, it was carried from *Weſt* to *Eaſt*; and the third they divided into two Librations, whereby the ſame eighth *Sphere* ſeemed to waver or librate through an Arch of two Degrees and twenty Minutes, ſometimes to the *Eaſt*, and ſometimes to the *Weſt*. They attributed the firſt Titubation, or Libration to a ninth *Sphere*, and the laſt, to a tenth, calling thoſe two *Spheres* the *Chryſtalline Heavens*; the firſt ſerved to account for that ſlow Motion of the fixed Stars above-mentioned, and the ſecond was to ſolve the Motions of Libration and Trepidation.

Note, That the *Motion of Trepidation* is a Kind of Libration or Shaking, which the antient *Aſtronomers* attributed to the *Chryſtalline Heaven*, to account for certain Irregularities, which they obſerved in the Motion of the Planets.

Therefore in this *Hypotheſis* the ninth *Sphere* is the firſt *Chryſtalline Heaven*, and the tenth the ſecond *Chryſtalline*; and conſequently there ſhould be eleven *Mobile Heavens*; to which ſome famous Theologians, and the *venerable Bede* among the reſt, have added a twelfth, which they place above the reſt, for the eternal Manſion of the Bleſſed, and which they call *Empyreum*; and this they make immobile and Square; becauſe 'tis ſaid in the *Apocalypſe*, *c.* 21. *v.* 16. that the celeſtial City is placed in a Square. The Order of theſe twelve *Heavens*, is expreſſed in the following Verſe:

Em mo cry cry ſi: Sa ju ma Sol ve me lu.

i. e. Empyreum; *Primum Mobile*; the ſecond *Chryſtalline*; the firſt *Chryſtalline*; the Firmament, *Saturn* deſigned by a Scythe; *Jupiter* by a Thunderbolt; *Mars* by a Buckler; *Sol* by his Diſk; *Venus* by a Mirrour; *Mercurius* by his Cadduce; and the *Moon* by a Creſcent.

But as the *Alphonſians*, beſides the proper Motion of the fixed Stars, or of the Firmament, from *Weſt* to *Eaſt*, have attributed to the ſame Firmament or eighth *Sphere*, another Motion (though a very uncertain one) which they called *Trepidation*; they have in the ſame Manner extended their Liberality to the inferior Planets, to each of whom (the *Sun* excepted) they have granted, beſides their proper Motion from *Weſt* to *Eaſt*, another which they call *Retrogradation*; beſides the *Sun*, as well as the other Planets is ſometimes more and ſometimes leſs diſtant from us. Whence *Ptolemy*, to explain all thoſe Appearances, has imagined *Excentrick Circles*, and *Epicicles*. By the *Excentrick*, he pretends to give ſufficient Reaſons for the greater or leſſer Diſtance of the Planets from the Earth; and to explain by the *Epicycles* their *Station*, *Direction*, and *Retrogradation*.

An EXCENTRICK CIRCLE, is a Circle which has not the ſame Center with the Earth, and is in this Syſtem the very *Orbit* of the Planet itſelf, and which it is ſuppoſed to deſcribe about the Earth, and which is conceived *Excentrick* thereto. The antient *Aſtronomers* called alſo this Circle *Deferent*, becauſe paſſing through the Center of the Planet it ſeems to ſupport or ſuſtain in its *Orbit*.

The PTOLEMAICK EPICYCLE is a Sphere which revolves with the *Moon*, of the Thickneſs allowed its *Heaven* or *Orbit*; and which ſometimes ſhews it higher and ſometimes lower.

Having thus given a general Idea of the *Ptolemaick Syſtem*, which all the modern *Aſtronomers* reject, as contrary to all their Obſervations, and attended with ſeveral Abſurdities, though in ſome Meaſure more agreeable to the Scripture, which Places the Earth at reſt upon its own Stability. We'll proceed to the COPERNICAN SYSTEM.

This Syſtem, which attributes a Motion to the Earth, has had its Partiſans in all Ages. *Firſt*, *Ariſtotle* tells us, *l.* 2. *de Cœlo. c.* 13. that *Pythagoras* and his Diſciples had placed the *Fire* or *Sun*, as the moſt perfect of the Elements in the Center of their Syſtem, and made the Earth move like a Planet round it; to which this other Opinion of the *Pythagoreans*, that the heavenly Bodies move, and by their Motion form an Harmony among them, is in no manner contrary; ſince the Earth, being a *Planet*, and having its

its Motion like the reſt, might be ſaid to obſerve by that Motion a conſtant Order, and to form an Harmony with the reſt of the heavenly Bodies.

Ariſtarchus the *Samian*, *Philolaus*, *Heraclides*, *Nicetas* of *Siracuſa*, *Ecphantus*, *Leucippus*, and *Plato* himſelf defended the *Pythagoræan Hypotheſis*, which when once reduced into a better Form by *Aſtronomical* Obſervation, acquired ſo great a Reputation, that it was very much illuſtrated by Cardinal *Cuſanus*; and after him *Nicholas Copernicus*, a Prebend of *Thorn* in *Poland*, employed thirty Years in an aſſiduous Labour, *viz.* from 1500 to 1530, to eſtabliſh it on the ſureſt and moſt demonſtrable Principle, hence it has been called ſince the *Copernican Hypotheſis*; and has been followed by almoſt all the moſt modern *Aſtronomers*, as *Joachim Rheticus*, *Chriſtopher Rothmannus*, *Meſthlinus*, *Eraſm. Reinold*, Computator of the *Prutenick-Tables*, *Kepler*, *Galilæo*, among the reſt, *Renatus des Cartes*, who by the new, perfect, and eaſy Method he has reduced it to, can claim a Right to it as his own. This *Hypotheſis* is digeſted in the following Manner.

The *Sun* (a) is placed in the Middle of our *Vortex*, or *Syſtem*, as a fixed Star. Around the *Sun* move in ſeveral *Orbits*, firſt *Mercury*, (b) who accompliſhes his Courſe in the Space of three Months; then *Venus*, (c) who perfects hers in eight Months. Afterwards comes the great *Orbit*, (e) which the Earth runs round in its annual Motion. About the Earth in a particular *Orbit* moves the *Moon*, (d) or rather *Ellipſis*, and who accompliſhes her Courſe in the Space of a Month. The great *Orbit* of the Earth is received into the Circle of *Mars*, which *Mars* over-run in the Space of two Years; to this ſucceeds the Circle of the *Orbit* of *Jupiter*; and to *Jupiter*, *Saturn*, or the *Orbit* of *Saturn*; ſo that *Jupiter*, in his *Orbit*, in the Space of twelve Years, and *Saturn* in his, in the Space of thirty, accompliſh their Courſes or Periods. Beſides as the *Moon* moves round the Earth, likewiſe four ſmall *Moons*, or Satellites move round *Jupiter*, and five round *Saturn*.

If we believe *des Cartes*, there are in our *Vortex* or *Syſtem*, in whoſe Center the *Sun* is placed, ſeveral ſmaller *Vortices*, *viz.* thoſe of *Saturn*, *Jupiter*, and of the *Earth* itſelf. In the Earth's *Vortex*, the *Moon* moves, as in an *Ellipſis*; and in the *Vortex* of *Saturn*, and of *Jupiter* moves *Saturn*, and *Jupiter*'s Satellites. The ſame *Des Cartes* believes, that what we have conceived of our *Vortex* can alſo be applied or attributed to all the others, which we may imagine round the fixed Stars; for every one of the fixed Stars ſeem to him as ſo many *Suns*, which have every one of them their *Vortex*.

The *Copernican* and *Carteſian Syſtem*, being thus clearly demonſtrated, we'll proceed to the Explication of its different *Phænomena*.

1. When the *Earth* by its diurnal Motion, is carried from *Weſt* to *Eaſt*, the *Sun* appears to us to be carried from *Eaſt* to *Weſt*, whence proceeds the Viciſſitude of the Day and Night.

2. The Earth moves not only round its *Axis*, but proceeds alſo each Day in the great *Orbit* or *Zodiack*, according to the Order of the *Signs*, in the ſame Manner a Globe rolled on a Plan, proceeds according to the Length of the Plan, while its Superficy turns round the Center or Axis; or as a Bird, flying from one End of a Ship under Sail to the other, moves alſo with the Ship. Therefore, while the Earth is between the *Sun* and one of the Signs, the *Sun* appears to be in the Sign oppoſite to that, *v. gr.* Suppoſe the *Earth* to be between *Aries* and the *Sun*, the *Sun* appears then to be in *Libra*; if the *Earth* be in *Cancer*, or between the *Sun* and *Cancer*, the *Sun* will be ſeen in *Capricorn*. In a Word if the Earth be in the boreal or northern *Signs*, the *Sun* will appear in the Auſtral or Southern *Signs*, and *vice verſa*.

3. In this Hypotheſis the *Axis* of the *Earth*, muſt always be conceived Parallel to itſelf, and to the *Axis* of the *Equator*; for if it was parallel to the *Axis* of the *Ecliptick*, there would be a perpetual and univerſal *Equinox*: That's to ſay, that the Days would be always, and every where, equal to the Nights; and there would happen no Changes in the Seaſons. But as the *Axis* of the Earth, being parallel to the *Axis* of the *Equator*, or of the World, exceeds 23 Degrees and an half from the *Axis* of the *Ecliptick*, and therefore inclines to the *Plane* of the *Ecliptick*, ſo as to form an Angle of 66 Degrees, 30 Minutes, and to keep always its Parallelism with the *Axis* of the World, or to move always in the ſame ſenſible Parts of *Heaven*; hence proceeds, while the Earth by its annual Motion is carried round the *Sun*, that Succeſſion in the Viciſſitude or Changes of Seaſons; for Example:

If at the Beginning of *Summer* (while the *Sun* appears in *Cancer*, and the Earth is in *Capricorn*) the Earth be placed in Œ, (*Fig.* 2.) and its *Axis* (S M) be parallel to the *Axis* of the World; and therefore diſtant 23 Degrees, 30 Minutes from the *Axis* of the *Ecliptick*, and conſequently inclined to the Plan of the annual *Orbit* of the Earth, agreeable to the Angle, B Œ H, 66 Degrees and an half, the *Ray* of the *Sun* perpendicular to the Earth, or the *Ray* carried from the *Sun*'s Center to the Earth's Center will touch the Superficy of the Earth, not in the terreſtrial *Equator*, but in the *Tropick* of *Cancer*, remote 23 Degrees 30 Minutes from the *Equator* towards the *Pole Arctick*, and therefore the illuminated Hemiſphere will comprehend the whole Circle Polar, *Arctick*; and exclude the whole *Antarctick*.

Let the Earth be transferred into, A, at the Beginning of *Autumn*, and the *Axis* of the Earth, S M, always remain Parallel, as well to itſelf, as to the *Axis* of the World: As the *Sun* appears at that Time in *Libra*, the Earth being then in *Aries*, the *Ray* conducted from the *Sun*'s Center to the Earth's Center, *perpendicular* then, to the *Axis* of the World, will fall on the Superficy of the Earth at the Beginning of *Libra*, and be diſtributed to both Poles.

Let's now imagine the *Earth* in, H, at the Beginning of *Winter*, the perpendicular *Ray* of the *Sun* (the Parallelism of the *Axis*, S M, always remaining) will fall on the *Tropick* of *Capricorn*; and therefore the illuminated, or lighted Hemiſphere, will contain within itſelf the *Antarctick* Pole, and exclude the *Arctick*.

Laſtly, The *Earth* being placed in, V, at the Beginning of the *Spring*, *i. e.* at the Beginning of *Libra*, at which Time the *Sun* appears in *Aries*, the *Ray* conducted from the *Sun*'s Center to the *Earth*'s Center will reach the Superficy of the *Earth* at the Beginning of *Aries*, and then both Poles will be again illuminated; but as the illuminated Face of the *Earth* looks at the *Sun*, it cannot be conſpicuous to us who are placed without the *Figure*.

Thus the *Copernicans* explain, and elucidate the Viciſſitudes of the Seaſons.

Note, That a PARALLELISM, of the Earth's Axis, which we have mentioned ſeveral Times in this Place, is that Situation, or Motion of the Earth's *Axis*, in its Progreſs through its *Orbit*, whereby it ſtill looks to the ſame Point of the Heavens, *viz.* toward the Pole Star; ſo that if a Line be drawn parallel to its *Axis*, while in any one Poſition; the *Axis*, in all other Poſitions or Parts of the *Orbit*, will always be parallel to the ſame Line. This *Parallelism* is the neceſſary Reſult of the Earth's double Motion; the one round the *Sun*, the other round its own *Axis*. Nor is there any Neceſſity to imagine a third Motion, as ſome have done, to account for this *Parallelism*.

The Space B C, or D E, in the Sphere of the fixed Stars, which is equal to the annual *Orbit* of the Earth, appearing almoſt as a Point, by reaſon of its too great Diſtance from us; hence it follows, that the *Axis* of the Earth, in each Point of its great *Orbit*, ſhould always appear directed to the ſame Points, or Parts of the World; ſo that there ſhould always appear the ſame Altitude of the Pole, the ſame vertical Stars, and of

of the ſame Magnitude, with reſpect to the ſame Part of the World, although the Earth, by its annual Motion in the Zodiack, ſhould approach nearer theſe or thoſe Stars, or nearer the North or South.

If this *Hypotheſis* ſhould appear ridiculous, or impoſſible, to ſome, the *Copernicans* would tell them, that they ſhould remember the great Abſurdities found in the *Ptolemaic Syſtem*; as the prodigious Rapidity with which the *Primum mobile* muſt accompliſh its diurnal Courſe; then the Revolution of the inferior Spheres, againſt the Motion of the *Primum mobile*, though they are daily carried along with it. Which Abſurdities are corrected, by the *Copernican Hypotheſis*; ſince, by the diurnal Motion of the Earth, that incredible Velocity of the *Sun*, as well as that of the fixed Stars, whereby the remoteſt ſhould be carried with 400,000 Times more Rapidity than a Ball from a Cannon) is rendered vain, and uſeleſs. How eaſier it is, ſay they, for the ſmall Sphere of the Earth, ſo fit for Motion, by its round Figure, to move round the *Sun*; than for a huge Machine, whoſe exterior Figure is utterly unknown, to be carried with ſuch incredible Velocity round ſo ſmall a *Pole* as the Earth.

When it is ſaid, in the *Copernican Hypotheſis*, that the Earth, while carried through its great annual *Orbit*, keeps the *Parallelism* of its *Axis*; this is not to be ſo ſtrictly underſtood, as if that *Axis* did not change a little its *Situation*, and could not by a very ſlow Motion, *viz.* in the Space of 25816 *Egyptian* Years, according to *Copernicus*, deſcribe a certain Circle, towards the Poles of the *Zodiack*, againſt the Order of the *Signs*, or from Eaſt to Weſt; the Semidiameter of which Circle, is, according to the ſaid *Copernicus*, 23 Degrees, and 40 Minutes: Whence it muſt follow, that the Interſections of the *Ecliptick*, and of the *Equator*, or the *equinoctial Points*, are carried, by the ſame Motion, againſt the Order, or *in præcedentia* of the Signs; a Motion called, by *Copernicus*, the *Preceſſion of the Equinoxes*. Hence he has drawn the Appearance of the Motion of the fixed Stars, by which they ſeemed to be carried, according to the Order, or *in conſequentia* of the Signs, from Weſt to Eaſt, and changed the apparent Mutation of Diſtance of the fixed Stars, from the *equinoctial Points* toward the Eaſt, into a real Motion of *Preceſſion of the Equinoxes*.

Note, That PRECESSION, in this Place, is a Term applied to the *Equinoxes*, which by a very ſlow, inſenſible Motion, change their Places, going backward, or weſtward, *i. e. in antecedentia*, as Aſtronomers call it, or contrary to the Order of the *Signs*. The *Pole*, the *Solſtices*, the *Equinoxes*, and all the other Points of the *Ecliptick*, have a retrograde Motion; and are continually moving from Eaſt to Weſt, or from *Aries* towards *Piſces*, &c. by means whereof the *equinoctial Points* are carried farther and farther back, among the preceding Signs of Stars, at the Rate of about 50 Seconds each Year; which retrograde Motion is called the *Preceſſion*, *Receſſion*, or *Retroceſſion* of the *Equinoxes*.

Hence, as the fixed Stars remain immoveable, and the *Equinoxes* go backward, the Stars will ſeem to move more and more eaſtward with reſpect thereto; whence the Longitudes of the Stars, which are reckoned from the firſt Point of *Aries*, or the *vernal Equinox*, are continually increaſing.

Hence the Motion of the *Axis* of the Earth has ſometimes appeared unequal; ſince from the Time of *Timocharides*, to that of *Ptolemy*, the fixed Stars ſeemed, every Hundred Years, to have moved a Degree, according to the Order of the Signs. From *Ptolemy* to *Albategnius*, they run one Degree every 66 Years. At preſent, they accompliſh one Degree, according to *Tycho Brahe*, in 70 Years; ſo that their Revolution is finiſhed in 25806 *Julian* Years. But in *Ricciolus*'s Opinion, they employ 72 Years in running a Degree; therefore they cannot accompliſh their Revolution in leſs than 25920 Years.

To rectify this Irregularity of Motion, and keep ſtill the fixed Stars immoveable, *Copernicus* has imagined an Irregularity in the Motion of *Preceſſion of the Equinoxes*; whoſe *Anomaly* ſhould be reſtored in 1717 *Egyptian* Years.

Note, That ANOMALY, in *Aſtronomy*, is the Diſtance of a Planet from the *Aphelion*, or *Apogee*; or an Irregularity in the Motion of a Planet, whereby it deviates from the *Aphelion* or *Apogee*. But as the Obliquity of the *Ecliptick* had been obſerved to vary otherwiſe, by the antient Aſtronomers, and its *Anomaly* to take twice the Time of the *Anomaly* of the *Equinoxes*, before it could be finiſhed, *viz.* 3434 *Egyptian* Years; he has explained both Inequalities, by the ſole Motion of the Poles of the Earth; and by imagining the *Axis* of the Earth to be carried from North to South, and from South to North, in the Interval of 24 Minutes only; and from Eaſt to Weſt, and from Weſt to Eaſt, through an Arch of 2 Degrees, and 20 Minutes; ſo that by thoſe *complicate Motions*, the Extremity of the *Axis* forms a *Corolla interta*, in the two Revolutions of the *Anomaly* of the *Equinoxes*, and in one of the Obliquity of the *Zodiack*, following the Order of the Numbers 1, 2, 3, 4, 5, 6, 7, 8, 9: Whence 'tis underſtood, that ſeven, or more, of thoſe *Corolla's*, are contained in an entire Revolution of 25816 *Egyptian* Years; during which Time, the *Axis* of the Earth is carried round the Poles of the *Zodiack*, againſt the Order of the *Signs*.

Now as to what relates to the *Stations*, *Directions*, and *Retrogradations* of the *Planets*, it may be explained, in this *Hypotheſis*, with an admirable Facility, and without being obliged to have Recourſe to *Epicycles*. *Venus* and *Mercury* have ſooner finiſhed their Courſes round the Sun, than the Earth; becauſe they deſcribe their Circles nearer the Sun; and the Earth ſooner than *Mars*, *Jupiter*, and *Saturn*. Whence it happens, that the Earth paſſes, ſometimes, between the ſuperior Planets and the Sun, the ſame as *Venus* and *Mercury* paſs between the Sun and the Earth. For Example,

Let the Sun be k, and the annual Circle of the Earth b h j c T l; the Circle of ſome of the ſuperior Planets, *viz.* of *Saturn*, *Jupiter*, or *Mars*, be o d q R E P, an Arch of which, or at leaſt a Portion thereof, a Planet ſhould viſit while the Earth is running through its whole Circle. Let alſo the Firmament be M F G N.

If the Earth be placed in N, and the Planet in O, it will be ſeen in the Point of the Firmament M. Let the Earth advance from L to B, and the Planet from O to D, ſo that the Earth ſhould be very near to paſs between that Planet and the Sun; then the Planet will be ſeen in G; and becauſe it will appear to have haſtened its Motion from the Point M, to the Point C, ſuch Motion ſhall be called a direct Motion.

If afterwards the Earth arrives from the Point B to the Point H, and the Planet from the Point D to the Point q; this will again be ſeen in G, and be called ſtationary, which will be its firſt Station. But if the Earth was to paſs to I, and the Planet to R, the Planet will appear in D; and thereby appearing to have retrograded againſt the Order of the Signs, it will be then called retrograde.

If the Earth being in C, the Planet be in E, it will be ſeen again in D, and appear ſtationary; therefore this will be its ſecond Station.

Laſtly, When the Earth will be arrived from the Point C, into T, and the Planet into P, it will appear in N; and as it ſeems then to have advanced according to the Order of the Signs, it will be called again *direct*.

In this Manner, the *Station*, *Direction*, and *Retrogradation* of the ſuperior Planets, *Mars*, *Jupiter*, and *Saturn*,

Saturn, are very eaſily accounted for, according to the *Copernican Hypotheſis*. Where we are to obſerve, that there is a greater Quantity of *Retrogradation* in *Mars* than in *Jupiter*, and in *Jupiter* than *Saturn*.

As to the other Planets, called *inferior*, viz. *Venus* and *Mercury*; as they are nearer the Sun than the Earth, they alſo perfect their Courſe with a greater Celerity than ſhe can; whence they appear ſometimes placed between her and the Sun; and hence ſeem ſometimes to advance, ſometimes to ſtand ſtill, and ſometimes to be retrograde.

Let us then place the Earth to run in its Orbit the Part T B C D E F, *Fig.* 2. *cap.* 1. while *Mercury* runs the whole Circle G L M N O. If the Earth be in T, and *Mercury* in G, he'll be ſeen in the Point of the Firmament F. But if the Earth be arrived at the Point B, and *Mercury* at the Point I, *Meccury* will be ſeen in P. And becauſe the Progreſs will ſeem then to be made with a greater Celerity, it will be called *direct*. But where he'll gain the Point H, the Earth being in C, then he is to be *ſtationary*, becauſe he ſeems to ſtay almoſt in the ſame Point P. This is his firſt *Station*.

But if the Earth occupies the Point D, and *Mercury* the Point N, he'll appear in q; and thus will be *retrograde*, becauſe he'll be ſuppoſed removed againſt the Order of the *Signs*. But if the Earth being in E, *Mercury* is in O, he'll be thought *ſtationary*, becauſe he'll be ſeen in the ſame Point q. And then it will be his ſecond *Station*.

Laſtly, When the Earth will be in f, and *Mercury* in G j, *Mercury* will be referred to the Point I, and become *direct*, becauſe the Progreſs will then appear, made according to the Order of the *Signs*.

What is ſaid here of *Mercury*, is to be underſtood of *Venus*, this excepted, that theſe Mutations are not ſo frequent in her, becauſe ſhe takes more Time than *Mercury* to run through her *Orbit*.

The principal Arguments alledged againſt this *Hypotheſis*, are, 1. That the Motion of the Earth is repugnant to the Scripture; which teaches us in ſeveral Places, that the Sun moves, and the Earth is immoveable. *The Earth*, ſays the *Eccleſiaſtes*, chap. i. ver. 4. *abides for ever*. And ver. 5. *The Sun alſo riſes, and the Sun goes down, and haſtens to his Place where he aroſe*. And the Pſalmiſt, *Pſal.* civ. 5. *Who laid the Foundations of the Earth that it ſhould not be removed for ever*. And *Joſhua* x. 12. *Sun ſtand thou ſtill upon* Gibeon.

2. That if the Earth was far from the Centre of the World, and was to run, by an annual Motion, round a *great Orbit*, or the *Zodiac*; the ſame *vertical Stars* ſhould not always appear, neither could we ſee a whole Hemiſphere. That the Sun ſhould not become *Apogee*, or *Perigee*. That that immenſe Diſtance which makes the *great Orbit* which the Earth overruns every Year, appear to us as a Point, with regard to the Firmament, is entirely incredible.

3. That if the Earth were to move round its *Axis*, we ſhould be rendered ſenſible of it, by our Houſes, Buildings, *&c.* tumbling down.

4. That Bodies would not fall upon the Places perpendicularly under them; nor a Bullet, *e. gr.* ſhot perpendicularly from the Ground, fall back again upon the ſame Spot.

To the firſt Objection *Des Cartes* anſwers, *Tert. part. princip. num.* 18, 28, and 38. that the Earth does not move, though the *Vortex*, wherein it is contained, moves; and that there is even more Motion attributed to the Earth in the *Ptolemaick*, or *Tychonick* Syſtem, than in the *Copernican*; becauſe, according to *Copernicus*, the Earth is always environed with the ſame Particles of the Liquid, and reſts within them, as a Man ſitting in a Ship. As to the Objections taken from the Scripture, the *Copernicans* anſwer, That the ſacred Text ſpeaks very often according to the Prejudices of our Senſes, and often declares, not what the Thing is in Reality, but what it appears to be; *i. e.* in thoſe Affairs which do not concern the Faith. Thus the Moon is called, Gen. iv. 16. *A great Light*; though ſhe be, perhaps, the leſſer of all the *Aſters*, and though ſhe has no Light but what ſhe borrows from the Sun. That nothing is truer than what ſays the *Eccleſiaſtes*, that the *Earth abides for ever*, ſince that Sentence is immediately preceded by this other; *One Generation paſſes away, and another Generation comes, but the Earth abides for ever*. That is to ſay, it always remains the ſame, nor does it change its Exiſtence, though there happens a continual Succeſſion of Generations within it; whence it is well ſaid by the Pſalmiſt, that it is founded on its Stability, *i. e.* on its Solidity, according to the *Hebrew* Text, or on its Firmity, according to the old Verſion, made uſe of by St. *Auguſtine*. For the Earth is not diſſipated, or reduced into Duſt, but all its Parts are firmly connected together. But they deny that it muſt be concluded, from thoſe Paſſages, that the Earth is fixed, and without Motion, in the Centre of the World, ſince *Job*, inſpired by the *Holy Ghoſt*, ſays this of God, *c.* ix. *v.* 6. *which ſhakes the Earth out of her Place, and the Pillars thereof tremble*. Thereby *Job* ſeems to attribute ſome Motion to the Earth, or a Tranſlation from one Place to the other. Beſides the *Copernicans* confeſs that they would not deviate from the common Way of Speaking, ſince they ſay themſelves, that the *Sun* riſes, and declines towards the *Weſt*, and that therefore, if *Copernicus* had ſpoke to the *Sun* as *Joſhua* did, he had done it in the ſame Manner.

To the ſecond Objection they anſwer, 1. That there muſt appear always the ſame Altitude of the Pole, to us who inhabit the ſame Part of the Earth, and always the ſame vertical Stars, with an entire Hemiſphere; or ſix Signs of the *Zodiac*; ſince the great *Orbit*, which the Earth deſcribes by its annual Motion, is but like a Point in Reſpect to the Firmament, and the *Axis* of the Earth remains always parallel to the *Axis* of the World, and is always directed towards the ſame ſenſible Parts of *Heaven*. They ſay that there muſt always appear the ſame Altitude of the Poles, with Reſpect to us, provided we always inhabit the ſame Part of the Earth, and do not change *Horizon*, nor conſequently our *Zenith* or vertical Point; for if, leaving our firſt Place, we remove towards the North or South, having changed then our *Horizon*, or *Zenith*, ſome Parts of the Heavens will appear to us, which had been, till then, inconſpicuous to us; and others which appeared, while we inhabited the firſt Place, will be hidden: And thus the Altitude of the Pole will be changed, with reſpect to us; neither ſhall the ſame vertical Stars appear. 2. That the Sun is in *Apogee*, or fartheſt from the Earth, when the Earth is in *Aphelia*, i. e. at the greateſt Diſtance from the Sun; and *Perigee*, when the Earth is in *Perihelia*, or neareſt the Sun.

Note, That APHELION is that Point of the Earth's, or a Planet's *Orbit*, in which it is the fartheſt diſtant from the Sun that it can be. And *Perihelion*, that Point of the *Orbit* of a Planet, or of the Earth, wherein it is at its leaſt Diſtance from the Sun.

3. That the immenſe Diſtance of the fixed Stars from us, muſt not ſeem incredible, in whoſe Reſpect the Earth is but like a Point; ſince neither our Reaſon, or Obſervations, can convince us that that Diſtance is leſs; but, on the contrary, by its being ſuppoſed ſuch, all the *Phenomena* are eaſily explained, and demonſtrated.

They reply, to the third Objection, that we are not ſenſible, or do not perceive the Motion of the Earth, becauſe we float, and are in the ſame *Liquid* along with it; and that we muſt think the ſame of our Houſes, Buildings, Trees, *&c.* which conſequently muſt ſtand, and not be ſubverted. That they do not ſee why heavy Bodies ſhould not fall upon the Places perpendicularly under them, let the Earth be at Reſt, or move in the *Liquid*; ſince thoſe Bodies, beſides that Motion whereby they are precipitated downwards on the

Earth, participates, likewiſe, of the Motion of the whole *Vortex*; in the ſame Manner as a Stone thrown down from the Top of the Maſt, in a Ship ſailing, falls then at the Foot of the Maſt, as well as if the Ship was at Reſt; becauſe the Stone is moved, both by its own Motion, and by that of the Ship. Therefore, ſay they, if we'll ſpeak juſt, thoſe Motions judged perpendicular, are not in Fact right, but deſcribe a Curve. Though it muſt appear right to us; juſt as thoſe who are in the Ship imagine that a Ball thrown down from the Top to the Foot of the Maſt, has deſcended by a right Motion, though thoſe on the Shore have diſcovered two Motions; a perpendicular one, by which it was carried downward; and the other horizontal, by which it followed the Maſt of the Ship. Therefore the Ball, by that double Motion, deſcribes, not a right, but a curve Line. Laſtly, They pretend, that a Cannon Ball is not to be carried farther toward the Weſt, than toward the Eaſt; ſince that Ball puſhed toward the Eaſt, beſides the Motion it receives from the Cannon, participates alſo of the other Motion common to the whole *Vortex*; in the ſame Manner as two Perſons, one at the Poop, and the other at the Prow, throwing a Ball between them, he that throws the Ball toward the Poop, does not throw it farther than he that throws it toward the Prow, though the Superficy of the Ship moves from the Poop toward the Prow; becauſe the Ball, beſides the peculiar Motion it receives from the Gameſters, participates, alſo, of the common Motion of the whole Ship. Likewiſe, when a Cannon Ball is exploded toward the North, or toward the South, it does not only receive the Motion from the Cannon, but participates, likewiſe, of the Motion which is common to the Earth, and the Air wherein it is contained; whence it always follows a right Line, and hits the Mark.

They conclude, by ſaying, that to ſuppoſe the Earth at Reſt, confounds and deſtroys all the Order and Harmony of the Univerſe, annuls its Laws, and ſets every Part at Variance with each other, robs the Creator of half the Praiſe of his Works, and Mankind of the Pleaſure of the Contemplation thereof. That it renders the Motions of the Planets inextricable and uſeleſs, which otherwiſe are plain and ſimple. So that ſuch of the later Aſtronomers as have aſſerted it with the moſt Zeal, have been forced to ſet it aſide, when they came to compute the Motions of the Planets. That none of them would attempt to compute thoſe Motions in variable Spirals, but in all their Theories they tacitly ſuppoſe the Earth to move on its Axis, ſo as to turn the diurnal Spirals into Circles.

Copernicus, the Author of this *Hypotheſis*, was born at *Thorn*, in *Poliſh Pruſſia*, in the Year 1472, according to *Juſtinus*, or 1473, according to *Mæſtlinus*. After the uſual domeſtick Education, he was ſent to the Univerſity of *Cracow*; where he applied himſelf to Philoſophy and Phyſick, and at length commenced Doctor in Medicine. In the mean Time, having a ſtrong Propenſity to Mathematicks, he diligently attended the Lectures of *Albert Bradzevius*, and even learn'd of him at Home. After he had here attained to the Uſe of the Aſtrolabe, and was entering upon Aſtronomy, he took *Regiomontanus* for his Guide: Though he run through all the Mathematicks of the Age, yet he ſeemed moſt taken with Perſpective; on Occaſion whereof, he learned Painting, in which he is ſaid to have excelled. When 23 Years of Age, being at *Bologna*, he became acquainted with that eminent Mathematician, Dom. *Maria Ferrarienſis*; and was admitted to ſhare with him in making aſtronomical Obſervations. Here, in the Year 1497, *Copernicus* firſt obſerved an Occultation of *Palilicium* by the Moon. Going on to *Rome*, he taught publickly, and made ſome conſiderable Obſervations; and at his Return to *Cracow*, was made Canon of the Church of *Wermelandt*, or *Ormeland*, and at length Vicar General.

The Courſe he took in proſecuting *Aſtronomy*, which has rendered his Name immortal, is as follows: Obſerving how the *Aſtronomers* of thoſe Times were gravelled to make the Planets move equably in circular *Orbits*, *viz.* to ſuppoſe them to move, not about their own Centre, but about the *Equant*; and that they could no Way make out a tolerably regular Syſtem, out of all their Shifts and Hypotheſes; he reſolved to try what he could do. With this View, he peruſed the Writings of all the Philoſophers and Aſtronomers extant, and picked out of each what appeared probable and elegant. In this Review, he was chiefly taken with two almoſt ſimilar Opinions, (the one attributed to *Martianus Capella*, the other to *Apollonius Pergæus*;) which give a very good Account of the Motions of *Venus* and *Mercury*, and explain the Cauſe of their *Directions*, *Stations*, and *Retrogradations* very happily: The latter, withal, performing the ſame in the three ſuperior Planets. But then, in both theſe Hypotheſes, the Earth being ſuppoſed the Centre, *Copernicus* choſe rather to adopt the Opinion of the *Pythagoreans*; to remove the Earth out of the Centre of the World, and to give it not only a diurnal Motion round its own *Axis*, but alſo an annual one round the *Sun*.

On this Footing, he began to obſerve, calculate, compare, *&c.* and at length, after a long ſollicitous Diſquiſition, found himſelf in a Condition to account for the *Phenomena* and Motions of all the Planets, and to make an orderly Arrangement, or Diſpoſition of the whole Heavens; wherein nothing could be altered, or diſplaced, without bringing the utmoſt Confuſion into the whole.

Theſe Things he began to write down about the Year 1507; he then proceeded to furniſh himſelf with a new *Apparatus*, particularly a *parallactick* Inſtrument, and ſome *Ptolemaick* Rulers, wherewith to obſerve the Altitude of the Stars, and determine the Periods of the Sun and Moon: And without any other Means, compoſed his ſix Books, *De Orbium Celeſtium revolutionibus*; containing the whole of *Aſtronomy*, delivered after the Example of *Ptolemy*, in a geometrical Method. We have already obſerved, that he began it in 1507; he finiſhed it in 1530; five Years after, he poliſhed, and improved it. He died of a *Dyſentery*, and a *Palſy* on his Right Side, in the Year 1543.

As the *Copernican Syſtem* appeared contrary to Prejudices and Authority, and that of *Ptolemy* to Reaſon and Experience; *Tycho Brahe*, a noble *Dane*, applied himſelf, in the ſixteenth Century, under the Reign of *Chriſtian* IV. King of *Denmark*, to find out a third, which has been called ſince, from his Name, the *Tychonick Syſtem*.

With *Ptolemy*, he places the *Earth* immoveable in the Centre, or not far from the Centre of the Firmament; and, with *Copernicus*, the *Sun* in the Centre of the Motion of the *Planets*; making the *Moon* to move round the *Earth*.

In this *Syſtem*, three Things move round the *Earth* as round their Centre; the *Moon*, which is the neareſt to it, by a monthly Motion; the *Sun*, which is more diſtant from it, by an annual Courſe; and the *Firmament*, or the *Sphere* of the *fixed Stars*, the remoteſt of all three, by a ſlow Motion of 25000 Years.

Round the *Sun* five *errant Stars*, or *Planets*, have their particular Motions, *viz.* *Mercury*, of three Months; *Venus*, of eight Months, *&c.* with this Order, or Rule, that the *Sun*, by his annual Motion, running through the *Zodiac*, carries them all along with him. Beſides, as *Mercury* and *Venus*, by their Revolutions round him, do not embrace the *Earth*; *Mars*, *Jupiter*, and *Saturn*, embrace it by theirs, but eſpecially *Mars*, which, while in B, becomes nearer the *Earth* than the *Sun* himſelf.

But there is no mention made, in the *Tychonick Syſtem*, of a diurnal Motion; thoſe who follow his *Hypotheſis*, place a *Primum mobile* above the *Firmament*, whereby the whole Machine of the World may be moved by a diurnal Motion; or ſuppoſe thoſe three *Mobiles*, the *Moon*, the *Sun*, and the *Sphere* of the *fixed*

fixed Stars, while by a ſlow Motion they move from Weſt to Eaſt in the *Zodiac*, to be alſo moved daily from Eaſt to Weſt, in a Circle, almoſt Parallel to the Equator. Moreover they conceive that the five errant Stars, beſides their proper Motions, they have round the *Sun* from Weſt to Eaſt through the *Zodiac*, are alſo carried daily from Eaſt to Weſt, in a Plan parallel to the *Equator*, not by themſelves, but by the *Sun* who ſerves them inſtead of *Primum mobile*.

The *Tychonicians* have this common, with the *Copernicans*, that they both acknowledge the Heaven's Fluid; and in Fact the *Tychonick Syſtem* is nothing elſe but that of *Copernicus* inverted, for if the *Sun* with *Venus* and *Mercury* was reſtored to the Centre of the World, the Earth would accompliſh its annual Period through the Circle aſſigned to the *Sun*, and the Planets, or the Sphere of the fix'd Stars would be underſtood to remove at ſuch a Diſtance, that the Circle of *Saturn* would be every where equally diſtant from the fix'd Stars; and then the Syſtem would be the ſame as deſcribed by *Copernicus*.

As to the Number of Heavens, *Tycho*'s Partiſans admit of three, *viz.* the *Empyreum*, the *Firmament*, and the *Planetick*, which Number they pretend to ſupport with the Authority of the Apoſtle, who is ſaid, *Eph.* ii. *Corinth. c.* xii. *v.* 12. to have been caught up to the third Heaven; *i. e.* as they interpret it, to the *Empyreum*. But thoſe among them who place a *Primum mobile* above the Firmament, ought to reckon four Heavens, and therefore cannot be aſſiſted therein by the Text of the Apoſtle, which, on the contrary, the *Copernicans* and *Carteſians* borrow to ſupport their Hypotheſis. For our *Vortex* is the firſt Heaven of the *Carteſians*; that vaſt Region of the fix'd Stars conſpicuous to us, eſtabliſhes another with Reſpect to us; and all that is extended beyond that immenſe Region may form the *Empyreum*, or a *third Heaven*.

Tycho and his Diſciples had proceeded thus far in the Explanation, as well of the diurnal Motions of the heavenly Bodies from Eaſt to Weſt, in a Plan Parallel to the Equator, as of the monthly, annual, *&c.* from Weſt to Eaſt in the *Zodiac*; but there remained ſtill, for them, to explain the *Station*, *Direction*, and *Retrogradation* of the Planets, when *Kepler*, by an admirable Invention, undertook that arduous Taſk.

This famous *Aſtronomer* (conſidering the whole Planetick Region thus drawn, the *Sun* in ſuch a Manner as for the *Axis* to keep always its *Parallelism*, and for each Planet, beſides, to have, at the Times fixed, its particular Motion round the *Sun*) ſhews how to compoſe a ſpiral Motion from thoſe two, *viz.* of Abduction from the *Sun*, and of Converſion round the *Sun*. For Example:

Let the Earth be T, and the *Orbit* of the *Sun*, in which he is moved, SSSS. If *Jupiter* be in A, and by a compoſite Motion, as we have ſaid, be carried into B, it will become *Stationary*; becauſe it is not underſtood to move, nor according to the Order of the Signs, nor againſt it. If afterwards it paſſes from the Point B to C, it will be direct, becauſe it advances according to the Order of the Signs; and from the Point C to the Point D becomes again Stationary. But from the Point D to E, becauſe carried againſt the Order of the Signs, it will be called *Retrograde*.

However the Planets do not accompliſh a whole *Spiral* every Year; but that Time is required which is neceſſary for a Conjunction of the *Sun* with the Planet, particularly if the Beginning of the *Spiral Motion*, is taken from the Conjunction; or for an Oppoſition, if the Beginning of the *Spiral Motion* is expected from an Oppoſition. Therefore we muſt imagine eleven of thoſe *Spirals* in the Circle of *Jupiter*; twenty-nine in the Circle of *Saturn*, &c. which *Spirals* are greater in *Jupiter* than in *Saturn*, and again greater in *Mars* than in *Jupiter*; whence thoſe *Spirals* are not ſo ſoon perfected in *Mars* as in *Jupiter*; nor ſo ſoon in *Jupiter* as in *Saturn*.

From this Explanation of the different Syſtems of the World, which I conſider as the Foundation of this Treatiſe of *Aſtronomy*, and without which it would be abſolutely impoſſible, for thoſe who have not the leaſt Tincture of that Science, to underſtand it, I'll proceed to the Demonſtration of the Diſtances, Magnitudes, Motions, *&c.* of the celeſtial Bodies; but the better to execute this difficult or arduous Taſk, we muſt firſt take a View of the Figure and Dimenſion of our Earth; and as we make uſe of Feet or Cubits to meaſure the Diſtances of Places on the *terreſtrial Globe*; we'll likewiſe meaſure the immenſe Diſtances of the celeſtial Bodies, with the Aſſiſtance of terreſtrial Semidiameters; which the better to execute, we'll conſider firſt the Figure of the Earth, and afterwards its Magnitude or Extent.

The *Figure of the Earth* is demonſtrated to be nearly ſpherical thus: The Moon is frequently ſeen eclipſed by the Shadow of the Earth; and in all Eclipſes that Shadow appears circular, what Way ſoever it be projected, whether towards the Eaſt, Weſt, North, or South, howſoever in Diameter vary, according to the greater or leſs Diſtance from the Earth.

Hence it follows that the Shadow of the Earth, in all its Situations, is really conical; and conſequently the Body that projects it, *i. e.* the Earth is nearly *Spherical*. We ſay its nearly *Spherical*; for the Inequalities of its Surface prevent its being perfectly ſo; beſides that *Huygens* and Sir *Iſaac Newton* have ſhewn that the Earth is higher and bigger under the *Equator* than at the *Poles*: So that its Figure, nearly, is that of an *oblate Spheroid*, ſwelling out towards the Equatorial Parts, and flatted or contracted towards the Poles. The Reaſon of this Inequality is deduced from the diurnal Rotation of the Earth on its *Axis*.

This Roundneſs of the Earth is farther confirmed by its having been frequently ſailed round: The firſt Time was in the Year 1519, when *Ferdinand Magellan* made the Tour of the whole Globe in 1124 Days. In the Year 1557 *Drake* performed the ſame in 1056 Days. In the Year 1586, Sir *Thomas Cavendiſh* made the ſame Voyage in 777 Days. *Simon Cordes* of *Rotterdam*, in the Year 1590; and in the Year 1598, *Oliver Noort*, a *Hollander*, in 1077 Days. *Jac. Heremites*, and *Joh. Huygens*, in the Year 1623, in 802 Days: All of whom ſailing continually from Eaſt to Weſt, at length arrived in *Europe*, whence they ſet forth; and in the Courſe of their Voyage obſerved all the *Phænomena*, both of the Heavens and Earth, to correſpond and confeſs this ſpherical Figure.

What the Earth loſes of its Sphericity by Mountains and Valleys, is nothing conſiderable; the higheſt Eminence being ſcarce equivalent to the minuteſt Protuberance on the Surface of a Lemon: What it loſes by the Swelling of the equatorial Parts is more ſenſible. Sir *Iſaac Newton* makes the greateſt Diameter 34 Miles bigger than the leſs, fixing the *Ratio* as 692 to 688. If the Earth were in a fluid State, its Revolution round its *Axis* would neceſſarily put on ſuch a Figure, by reaſon the centrifugal Force being greateſt towards the Equator, the Fluid would there riſe, and ſwell moſt: And that it ſhould be ſo now, ſeems neceſſary to keep the Sea in the *Equinoctial* Regions from overflowing the Earth thereabouts. Add thoſe Experiments made on Pendulums, which muſt be of different Lengths, to ſwing equal Times here and at the *Equator*, evince the ſame Thing.

M. *De la Lure*, and M. *Derham* indeed have ſhewn, that this Diverſity may ariſe either from the greater Heat, or the greater Rarity of the Air there than here; as having obſerved a-like Variation between Pendulums when heated and cold, and when in *Vacuo* and open Air. But beſides that Sir *Iſaac Newton* and *M. Bernoulli*, have ſet aſide theſe Cauſes as inſufficient. *M. Caſſini* has found, that the Degrees of a Meridian grows larger, the farther we go towards the Line by one eight hundredth Part of every Degree; which puts the Spheroidiſm of the Earth paſt Queſtion.

Fa. Tacquet draws ſome pretty Concluſions from the ſpherical Figure of the Earth; as, 1. That if one Part of the Surface of the Earth were quite

plain

plain, a Man could no more walk upright thereon, than on the Side of a Mountain. 2. That the Traveller's Head goes a greater Space than his Feet; and a Horſeman than a Man on Foot, as moving equal Arches of greater Circles. 3. That a Veſſel full of Water being raiſed perpendicularly, ſome of the Water will be continually flowing out, yet the Veſſel ſtill remains full; and on the contrary, if a Veſſel full of Water be let perpendicularly down, though nothing flow out, yet it will ceaſe to be full: Conſequently there is more Water contained in the ſame Veſſel at the Foot of a Mountain than at the Top; by Reaſon the Surface of the Water is compreſſed into a Segment of a leſs Sphere below than above.

The Antients had various Opinions as to the Figure of the Earth. Some, as *Anaximander*, held it cylindrical; and others, as *Leucippus*, in Form of a Drum. But the principal Opinion was, that it was flat; that the viſible *Horizon* was the Bounds of the Earth, and the Ocean the Bounds of the *Horizon*: That the Heavens and Earth above this Ocean, was the whole viſible Univerſe, and that all beneath the Ocean was *Hades*; of which Opinion were, not only divers of the antient Poets and Philoſophers, but alſo ſome of the Chriſtian Fathers, as *Lactantius*, St. *Auguſtin*, &c.

The MAGNITUDE OF THE EARTH, we are to conſider next, and the Number of Miles its Diameter contains, has been variouſly determined by various Authors, antient and modern. The Way to arrive at it is, by finding the Quantity of a Degree of a great Circle of the *Earth*. But this Degree is found very different, according to the different Method and Inſtruments made uſe of, as well as the different Obſervers.

The Method obſerved by Mr. *Norwood*, and the *French* Aſtronomers, *Picard*, *Caſſini*, &c *viz.* By meaſuring the Difference between two remote Places on the ſame Meridian, is undoubtedly the beſt; and was performed by ſuch exceeding Accuracy, eſpecially by M. *Caſſini*, that hardly any thing further or better can be expected. According to that Author the *Ambit*, or Circumference of the *Earth* is 123,750,720 *Paris* Feet; or 134,650,777 *Engliſh* Feet; or 25031½ of our Statute Miles; whence, ſuppoſing the *Earth* ſpherical, its Diameter muſt be 7967 Statute Miles; and conſequently its *Radius*, or Semi-diameter, may be taken in a round Number 200,000000 Feet; its Surface will be 199,444,206 Miles; which being multiplied into ⅓ of its Semi-diameter, gives the ſolid Content of the Globe of the *Earth* 264,856,000000 Cubick Miles.

Mr. *Whiſton* reckons the *Ambit* of the *Earth* to be 123,249,600 *Paris* Feet, or 131,630,573, or thereabouts, *Engliſh* Feet.

Having thus determined the *Figure* and *Magnitude of the Earth*, and nothing left in this ſublunary World, deſerving the Attention of the *Aſtronomer*, we'll abide no longer on theſe terreſtrial Manſions, but will be carried through that vaſt Ocean, and thoſe immenſe Intervals of the heavenly Bodies, beginning by thoſe which are at a greater Diſtance from us, and are called fix'd Stars, not from their being fixed in a hard *Fornix*, but from their obſerving always the ſame Diſtance between them; ſince we have demonſtrated already, that the Heavens are not hard or ſolid, but fluid; and that it is admitted by *Aſtronomers*, as a Thing very probable, that they are exended through indefinite Spaces, and have Stars diſperſed in them.

But to make this more evident, and to appear in a clearer Light, it will not be improper to inſert here the *Hypotheſis* of *Des Cartes* of the Formation of the World; ſince that once very well underſtood, it will be eaſy to account for all the *Phænomena* of the *fixed Stars*.

Des Cartes, then, *Tertia Part. Princip. num.* 45. and *Tract. de Lum. c.* 6. believes the World to have been formed in that Manner mentioned in the Scripture, *Gen.* i. ſo that every Part were perfect from the very Inſtant of their Creation, and all compleated in the ſeventh Day; but however he would have us examine, in a more particular Manner, how all the ſenſible Bodies could be formed, ſince thereby we ſhall be more capable to underſtand their Nature. 'Therefore, ſays he, *Num.* 46. let's ſuppoſe that Matter, which compoſes this viſible World, to have been at firſt divided by the Creator into ſmall Portions, or Maſſes full of Angles, of which the Heavens and heavenly Bodies are compoſed, which had then as much Motion of themſelves as the World is found to have. That thoſe Parts have two Motions; one whereby each Part revolve round its Centre, ſo as to compoſe a Fluid Body, ſuch as we ſuppoſe the Heavens to be; and another, whereby an Aſſemblage, or Syſtem of them, turned round a common Centre, whereby the Centres of the *fixed Stars* are formed.

'This muſt be firſt conſidered, continues he, *Numb.* xlviii. that thoſe Particles which we ſuppoſe the whole Matter of the World to have been divided into, could not be ſpherical at firſt, ſince ſeveral Globules joined together cannot fill up a continued Space, but of what Figure they were then, they could in Proceſs of Time, and after they had had ſo many circular Motions, but become round. Having been violently enough agitated for to be ſeparated from each other, and the ſame Agitation continuing, muſt have by a continual Friction broke their Angles. And as there can be no *Vacuum*, and thoſe round Particles of the Matter joined together, muſt have left ſome ſmall Intervals about them, it was abſolutely neceſſary that thoſe Intervals ſhould be filled, with ſome of the minuteſt Atoms of the Matter; and of a Figure proper to fill up thoſe Intervals, which Figure they could change as often as the Places they are to fill ſhould require; for when the Angles of the Particles which become round are broken; what's broke off is ſuch a fine Duſt, and acquires ſo great a Celerity, that by the ſole Velocity of its Motion, 'tis divided into innumerable Atoms, and thus fills up all the Angles which the other Particles of the Matter could not enter.

'Hence have been generated, two different kinds of Matter, which may be called the two firſt Elements of this viſible World. The firſt is of that Matter, which is ſo violently agitated, that by its Colliſion with other Bodies, 'tis broken into Minuties of an indefinite Parvity, or Smallneſs; and appropriate their Figures, to fill up the ſmalleſt Intervals, of the Angles they have deſerted.'

Of this Kind of Matter the *Sun* and the fixed Stars were formed.

The ſecond Kind of Matter is 'that divided into *ſpherical Particles*, which muſt be ſuppoſed very ſmall, if compared with the Bodies diſcernible by the Sight; but are, nevertheleſs, of a certain determinate Quantity, and diviſible into others infinitely ſmaller.

This Matter makes the Atmoſphere, and all the Element between the *Earth* and the *fixed Stars*; in ſuch Manner, as that the largeſt Spheres are always next the Circumference of the Vortex, and the ſmalleſt next its Centre.

There is, beſides, a third Element, compoſed of heavier Particles, and leſs adapted to Motion; of which the *Earth*, *Planets*, and all the opake Bodies are formed; this is its Origin. While the Matter of the firſt, and that of the ſecond Element move round the common Centre, and recede as much as they can from it, the Matter of the firſt Element, from the *Ecliptick* of the *Vortex*, influences all the circumjacent *Vortices* near their Poles, by falling between the Particles of the ſecond Element, which cannot happen to the ſecond Element; and reciprocally as much of the Matter of the firſt Element breaks forth from the adjacent *Vortex* into the ſame *Vortex*, through its Poles; ſo as for thoſe Poles to have a Communication between them, not by touching each other at their reſpective Poles, but by being directed to each other.

If

If then there are to be found in the Matter of the firſt Element, which is directed from the Poles to the Centers of the *Vortices*, ſome Particles leſs divided, and leſs agitated, theſe, becauſe of their hooked Figures, will be concatenated together, and being tranſformed, by their Agitation, into leſſer, and more adapted to Motion, they'll be condenſed into opake *Molecules*, and form the third Element.

As to the Figure of theſe *Molecules*, when they are found intercepted in the Middle of three Globules of the ſecond Element, and have the ſame Motion with the whole *Vortex*; they muſt aſſume a triangular Figure.

Des Cartes diſpoſes the Globules of the ſecond Element in the following Manner: He will have thoſe nearer the Center of the *Vortex*, to be leſs, and to move with a greater Celerity, till they have attained at a certain Term, beyond which the ſuperior move with a greater Celerity than the inferior, being all equal as to their Magnitude, *v. gr.* the Globules in our *Vortex*, *fig.* 9. in which float *Mercury* and *Venus*, are leſs, and move with a greater Celerity, than thoſe which take in the *Earth*; likewiſe thoſe round the *Earth* are leſs, and move with a greater Celerity than thoſe which move round *Mars*, or *Jupiter*, or round *Saturn*; ſince the *Earth* accompliſhes its Courſe in the Space of a Year, *Mars* in two, and *Saturn* in thirty Years; but beyond *Saturn*, as far as the Superficies of the *Vortex*, all the Globules might be imagined of an equal Magnitude among them, and are more agitated in thoſe Places than round *Saturn*.

Sir *Iſaac Newton* is of an Opinion different from *Des Cartes*, and thinks, that it is very probable that God, in the Beginning, formed Matter, in ſolid, maſſive, hard, impenetrable, moveable Particles, of ſuch Sizes, and Figures, and with ſuch other Properties, and in ſuch Proportion to Space, as much conduced to the End for which he formed them; and that theſe primitive Particles being Solids, are incomparably harder than any porous Bodies compounded of them; even ſo very hard, as never to wear out, no ordinary Power being able to divide what God made one in the firſt Creation. While the Particles remain entire, they may compoſe Bodies of one and the ſame Texture in all Ages; but ſhould they wear away, or break in Pieces, the Nature of Things depending on them would be changed. Water and Earth, compoſed of old worn Particles, and Fragments of Particles, would not be of the ſame Nature and Texture now, with Water and Earth compoſed of entire Particles in the Beginning. And therefore, that Things may be laſting, the Changes of corporeal Things are to be placed only in the various Separations, and new Aſſociations and Motions of thoſe permanent Particles, compound Particles being apt to break, not in the midſt of ſolid Particles, but where thoſe Particles are laid together, and only touch in a few Points. It ſeems to him, likewiſe, that theſe Particles have not only a *Vis inertiæ*, with the paſſive Laws of Motion reſulting therefrom, but are alſo moved by certain active Principles; ſuch as is Gravity, and that which cauſes Fermentation, and the Coheſion of Bodies.

My own *Hypotheſis*, or *Syſtem*, is, That in the Separation of the *Matter* at the Beginning, the three Elements, mentioned by *Des Cartes*, were formed by the Aſſociation of thoſe Particles, wherewith the divine Creator was determined each of them ſhould be compoſed, having himſelf, in his infinite Wiſdom, and as a ſkilful Artiſt, formed and diſpoſed each Particle in the Shape, Form, and Figure, he judged fit to compoſe (with a juſt Symmetry, which could anſwer the End he propoſed to himſelf from it) that GREAT WHOLE they were deſigned for. That the moſt ſubtle, and beſt configurated, having been *exalted* from the whole Maſs, were impregnated, in that *Exaltation*, with a Principle of Activity, and with a magnetick Virtue, or Quality, of Attraction and Repulſion, which, from that Inſtant, kept them in a perpetual Motion, and at ſuch competent Diſtance from each other, as to form themſelves into an elementary Subſtance, and Exiſtence. That that ſubtle Matter (which we'll call, if you pleaſe, the firſt Element) was divided by the Creator into two Parts; one Part whereof he placed in the Center of the World, or of the *Syſtem*, as in a *Medium*, between the ſecond and third Element, to quicken, by the extreme Celerity and Activity of its Effluvia, the Slowneſs of the Motion of their Particles, and to rectify the Diſorders which might be occaſioned by the different Configuration of their Particles. The other Part of that Element having received a ſtill greater Degree of Perfection, as well in the Symmetry and Arrangement of its Particles, as in their Expurgation from all heterogeneous Bodies, which could obſtruct their Action, following the *Impetus* of their natural Elaſticity proceeding from their globular Configuration, and by the Compreſſion of the Atmoſphere of that Maſs they had been extracted from, were carried upward with ſuch Velocity, that nothing but the immenſe Spaces they were to fill could have moderated their Courſe. That thus expanded, they began to move with that Order and Regularity, each in its reſpective *Orbit* formed by the *Effluvia*, which muſt neceſſarily flow from each other to keep a due Diſtance between them and avoid Confuſion, as to form a viſible *Certum quid*. That thus diſpoſed, floating, as it were, in their reſpective *Orbits*, without touching one another, otherwiſe than by the mutual Communication of their *Effluvia*, they can ſuffer no Alteration, or Changes, ſince, by the natural Configuration of their Pores, adapted, from the Beginning, for Attraction, Direction, or Repulſion; thoſe different Actions are made, without the leaſt Force or Violence, through the Particles, which could alter their natural Form; being thereby free from that Colliſion, Grinding, *&c.* to be met with in *Des Cartes*'s *Syſtem*.

As for the Formation of the *fixed Stars*, in this *my Hypotheſis*, I ſuppoſe, that in that *elaſtick Rapidity* of the Particles of the firſt Element, at the Beginning, thoſe endued with a ſtill greater Principle of Activity and Elaſticity, having preceded the others in their Progreſs, and arrived ſooner at the Term fixed, had formed themſelves into an infinite Number of different *Focus's*, the Intervals whereof were afterwards filled with the other leſs active Particles. That in thoſe *Focus's*, preſerving that extremely perfect Virtue or Quality of Attraction, Direction, and Repulſion, they move with ſuch incomprehenſible Rapidity, as to cauſe that Radiancy, a Glimpſe whereof is tranſmitted to our Sight; which would appear infinitely greater, notwithſtanding their immenſe Diſtance *from* us, if the Creator had not formed of thoſe other Particles ſeparated from them, in the laſt Rarefaction, a Veil, which ſteals from, or dims part of their *Eclat*; and this is what I call the ſecond Element, which being compoſed of more palpable *Molecules* than the firſt, and their *Effluvia* (for they all move in the ſame Manner) endued with leſs Activity, is nevertheleſs capable of *Refraction*. Of the *Scories* of thoſe ſublimated Particles, the third Element is formed, which being but a Compoſition of hooked Particles, of different Configurations, is a great deal ſlower in its Motion, ſome of them, by their Concatenation, appearing as if they were at Reſt, and entirely deprived of Motion: Of theſe thoſe Bodies, through whoſe Opacity the Light of that Part of the firſt Element placed in the Center of the *Syſtem*, and which we call *Sun*, is reflected on our *Vortex*; ſuch as the *Planets*.

Having thus explained the *Hypotheſis* of the Origin of the World, and the different Elements; we'll proceed to the Explanation of the Doctrine of the *fixed Stars*; and firſt of their Motion.

The FIXED STARS have two Kinds of Motions; one called the *firſt*, *common*, and *diurnal Motion*, or the *Motion* of the *Primum mobile*: By this they are carried along with the *Sphere* or *Firmament* wherein they appear fixed, round the *Earth*, from Eaſt to Weſt, in the Space of twenty-four Hours.

The other, called the *ſecond*, or *proper Motion*, is that whereby they go backwards, from Weſt to Eaſt,

round the Poles of the *Ecliptick*, with an exceeding Slowneſs, as not deſcribing above a Degree of their Circle in the Space of 71 or 72 Years, or 51 Seconds in a Year. Some have imagined, that when they have got round to the Points whence they firſt departed, Nature will have finiſhed her Courſe, and the *Stars*, having performed their Career, the Heavens will remain at Reſt, unleſs the Being, who firſt gave them Motion, appoints them to begin another Circuit. On the Footing of this Calculation, the World ſhould laſt about 30,000 Years, according to *Ptolemy*; 25816, according to *Tycho*; 25920, according to *Riccioli*; and 24800, according to *Caſſini*.

In Effect, the *Latitudes* of the *fixed Stars*, we find, by comparing the Obſervations of the *antient* Aſtronomers with thoſe of the *Moderns*, continue ſtill the ſame; but their *Longitude* is, by this *ſecond Motion*, always increaſing. Thus, for Example, the *Longitude* of *Cor Leonis* was found by *Ptolemy*, *A. D.* 138, to be 2° 30′; in 1115 it was obſerved by the *Perſians* to be 17° 30′; in 1364, by *Alphonſus*, 20° 40′; in 1586, by the Prince of *Heſſe*, 24° 11′; in 1601, by *Tycho*, 24° 17′; and in 1690, by Mr. *Flamſteed*, 25° 31′ 20″: Whence the *proper Motion* of the *Stars*, according to the Order of the *Signs*, in Circles parallel to the *Ecliptick*, is eaſily inferred.

It was *Hipparchus* firſt ſuſpected this *Motion*, upon comparing the Obſervations of *Tymocharis* and *Ariſtyllus* with his own. *Ptolemy*, who lived three Centuries after *Hipparchus*, demonſtrated the ſame by undeniable Arguments. Some, it is true, have imagined a Change in the *Latitude* of the *Stars*; but ſuch an Opinion has but little Countenance from Obſervation. *Tycho Brahe* makes the Increaſe of *Longitude* in a Century 1° 25′; *Copernicus* 1° 23′ 40″ 12‴; *Bullialdus* 1° 24′ 54″; *Hevelius* 1° 24′ 46″ 50‴; whence, with Mr. *Flamſteed*, the annual Increaſe of the *Longitudes* of the *fixed Stars* may be well fixed at 50″.

From theſe *Data*, the Increaſe of the *Longitude* of a *Star*, for any given Time, is eaſily had; and hence the *Longitude* of a *Star*, for any given Year, being given, its *Longitude* for any other Year is readily found.

The better to underſtand this *Phænomenon*, we muſt imagine, that the *Earth*, in its annual Motion round the *Sun*, does not keep exactly a Parallelism, and therefore is ſubject to ſome imperceptible *Titubation*, that, in the Courſe of ſeveral Thouſand Years, each of its Poles deſcribes a ſmall Circle, from Eaſt to Weſt.

As, from this Suppoſition, it is eaſily conceived that the *Celeſtial Equator* correſponds to the different Parts of Heaven; it follows, that the *Terreſtrial Equator* muſt be ſubject to the ſame *Mutations*, and muſt cut the *Ecliptick* into various Points, from Eaſt to Weſt: And becauſe from the Interſection of thoſe two Circles is reckoned the *Longitude* of the *Stars*, they muſt neceſſarily be ſeen to increaſe, every Century, to a *certain Quantity*.

The *Mutation* happening in a certain Number of Years to the *Longitude* of ſome *Stars*, muſt be ſemblable to that which happens to the *Longitude* of another *Star*; and all the *Stars* muſt be altogether ſuſceptible of *Mutation* in *Longitude*, which will be more ſenſible in one Century than in another, eſpecially if the *Titubation* of the *Earth* be more manifeſt in that Century than in another.

The *Diminution* of the *Declination* of the *Ecliptick*, cannot be better underſtood, than by minding that the *Titubation* of the *Earth* is occaſioned by a ſlight Direction of its *Axis* on the Plane of the *Ecliptick*, whence it follows, that the *Celeſtial Equator* muſt paſs over the Places nearer the Circle of the *Firmament*, under which the *Sun* is ſuppoſed to move; therefore as there is then a leſſer Diſtance from the *Ecliptick* to the *Equator*, than heretofore, we muſt judge that the firſt of thoſe Circles has approached the other.

The next Thing which falls under our Conſideration, with regard to the *fixed Stars*, is their *Magnitudes*, which appear to be very different; which Difference probably ariſes, not from any Difference in their real *Magnitudes*, but from their Diſtances, which are different. From this Difference the *Stars* become diſtributed into ſeven ſeveral Claſſes, called *Magnitudes*.

The firſt Claſs, or *Stars of the firſt Magnitude*, are thoſe neareſt us, and whoſe Diameters are therefore biggeſt. Next theſe, are thoſe of the *ſecond Magnitude*; and ſo on, to the *ſixth*, which comprehends the ſmalleſt *Stars* viſible to the naked Eye; all beyond, are called *Teleſcopick Stars*. Not that all the *Stars* of each Claſs appear juſtly of the ſame *Magnitude*; there is a great Latitude in this Reſpect, and thoſe of the *firſt Magnitude* appear almoſt all different in Luſtre, and Size. Other *Stars* there are, of *intermediate Magnitudes*, which Aſtronomers cannot refer to this, rather than the next Claſs, and therefore place them between the two.

Procyon, for Inſtance, which *Ptolemy* makes of the *firſt Magnitude*, and *Tycho* of the *ſecond*, *Flamſteed* lays down as between the *firſt* and *ſecond*. Thus, inſtead of ſix ſeveral *Magnitudes*, we have really ſix Times ſix. Some Authors aſſert, that the *Stars* of the *firſt Magnitude* ſubtend an Angle of at leaſt a Minute; but the *Earth*'s *Orbit* ſeen from the *fixed Stars*, only ſubtends an Angle of 20 Seconds; and hence they conclude that the Diameters of the *Stars* are vaſtly greater than that of the *Earth*'s whole *Orbit*. Now a Sphere whoſe Semidiameter only equals the Diſtance between the *Sun* and the *Earth*, is, by ſome, ſuppoſed to be Ten Millions of Times greater than the *Sun*; conſequently the *fixed Stars* muſt be much more than Ten Millions of Times greater than the *Sun*. But Mr. *Whiſton* is of Opinion, that this is a Miſtake, and that the Diameters, even of the largeſt *Stars*, viewed through a Teleſcope, which magnifies, for Example, a Hundred Times, ſubtend no viſible Angle at all, but are mere lucid Points.

The Incertitude, as to the *Magnitude*, and Diſtance of the *fixed Stars* from us, proceeds from their having no *Parallax*; ſince all Aſtronomers, both *antient* and *modern*, agree, that the Doctrine of the *Diſtances* of the *Celeſtial Bodies* conſiſts in their *Parallaxes*, and that it is impoſſible we ſhould have any juſt Obſervation without it.

Note, That a PARALLAX is an Arch of the Heavens intercepted between the *true Place* of a *Star*, and its *apparent Place*. The *true Place* of a *Star*, is that Point of the Heavens wherein it would be ſeen by an Eye placed in the *Center* of the *Earth*. The *apparent Place*, is that Point of the Heavens, wherein the *Star* appears, to an Eye on the *Surface* of the *Earth*.

It is paſt all Controverſy, that the *fixed Stars* have no diurnal *Parallax*; and a vaſt Number of Aſtronomers queſtion yet if they have an annual one; though ſeveral are of Opinion that they have, but ſo ſmall, that it is almoſt imperceptible, and cannot be obſerved but with the greateſt Care and Attention; in which *Hook* and *Flamſteed* imagined to have ſucceeded, and which to obtain, *Hook* had fixed a Teleſcope, of 30 Foot long, on the Roof of his Room, with whoſe Help having meaſured, in the Months of *July*, *Auguſt*, and *October*, the neareſt Diſtance from the *Vertical* of a *bright Star* in the Head of the *Dragon*; he always found its Diſtance from the *Vertical* continually diminiſhing, (very little declining from the *Zenith* towards the *North*) as the *Ratio* of a *Parallax* ſhould require; and at laſt obſerved that Diſtance from the *Vertical* to be ſo changed, as to admit of an Interval of 24 or 26 Seconds.

Flamſteed has ſince confirmed the annual *Parallax* of the *fixed Stars*, both by his own Obſervations, and by his Correction of thoſe of *Hook*; for he has obſerved, with great Care and Attention, for ſeven Years together, the ſame *Parallax* in the *fixed Stars*, and has, by the great Numbers of his Obſervations, reduced

reduced the *Parallax* to a certain Quantity. There is in the Tail of *Urſa minor*, a *Polar Star*, more apparent than the reſt, and conſequently more proper to find out the *Parallax* of the *fixed Stars*; for as that *Star* appears always at Night, provided the Sky be not overcaſt with Clouds; as it is always at ſuch a Diſtance from the Horizon, as to admit of not even the leaſt Refraction; as it appears always, to thoſe who take Obſervations, at the Meridian Circle, as well above, as under the Pole; as alſo from its great Diſtance from the *Ecliptick*; it muſt be ſubject to a *Parallax*: That *Star*, for theſe Reaſons, when carefully obſerved, muſt produce a *Parallax*. Therefore *Flamſteed* thought fit to make uſe of it, to diſcover, and to demonſtrate a *Parallax*, in which he flattered himſelf to have very well ſucceeded: For, after he had compared together, and ſupputed the fifteen Obſervations he made in the Space of ſeven Years, he found, that the *Polar Star* had a leſs *Latitude*, or Diſtance from the *Ecliptick*, towards the Summer's Solſtice, than towards the Winter's Solſtice.

Among the *fixed Stars*, there is a long, white, luminous Track, which ſeems to encompaſs the Heavens like a Swath, Scarf, or Girdle, called *Via Lactea*, or *Galaxy*, of Γαλαξιος, Milk; and which is eaſily perceived in a clear Night, eſpecially when the Moon does not appear. It paſſes between *Sagittary* and *Gemini*, and divides the Sphere into two Parts: It is unequally broad, and in ſome Parts is ſingle, in others double. The *antient Poets*, and even *Philoſophers*, ſpeak of the *Galaxy* as the Road, or Way, by which the Hero's went to Heaven.

Ariſtotle makes it a kind of Meteor, formed of a Croud of Vapours, drawn into that Part by certain large *Stars* diſpoſed in the Region of the Heavens anſwering hereto. Others finding that the *Galaxy* was ſeen all over the Globe, that it always correſponded to the ſame *fixed Stars*, and that it tranſcended the Height of the higheſt *Planet*; ſet aſide *Ariſtotle*'s Opinion, and placed the *Galaxy* in the *Firmament*, or Region of the *fixed Stars*, and concluded to be nothing but an Aſſemblage of an infinite Number of minute *Stars*.

Since the Invention of the Teleſcope, this Opinion has been abundantly confirmed. By directing a good Teleſcope to any Part of the *Milky Way*, where before we only ſaw a confuſed Whiteneſs, we now deſcry an innumerable Multitude of *little Stars*. Theſe *Stars* are ſo remote, that a naked Eye confounds them. The like we obſerve in thoſe other Spots called *nebuloſe Stars*, which, when examined with the Teleſcope, are diſtinctly perceived to be Cluſters of *little Stars*, too faint to affect the Eye ſingly.

The Number of the *Stars* appears to be vaſtly great, almoſt infinite; yet Aſtronomers have long ago aſcertained the Number of thoſe viſible to the Eye; which are found vaſtly fewer than one would imagine. *Hipparchus*, 125 Years before the Incarnation, on Occaſion of a *new Star* then appearing, made a Catalogue of the *Stars*, *i. e.* an Enumeration thereof, with an exact Deſcription of their *Magnitudes*, *Situation*, *Longitude*, *Latitude*, &c. that it might be known if any the like Change ſhould happen, for the future, in the Heavens. He made the Number of viſible *Stars* 1022. Theſe were reduced into 48 *Conſtellations*; and he laid it down, that if there ſometimes appeared more in Winter Nights, it was owing to a Deception of the Senſe. *Ptolemy* added four *Stars* to *Hipparchus*'s *Catalogue*, and made the Number 1026. In the Year 1437, *Ulug Beigh*, Grandſon of *Tamerlane*, in a new *Catalogue* he made, only gives 1017. But in the ſeventeenth Century, when *Aſtronomy* began to be retrieved, their Number was found to be much greater.

To the forty-eight *Conſtellations* of the Antients were added twelve new ones, diſcovered towards the South Pole, and two towards the North; beſides ſeveral others not univerſally admitted, as the *Flower-de-lis*, the *Royal Oak*, &c.

Tycho Brahe publiſhed a Catalogue of 777 Stars, from his own Obſervations; which *Kepler* from *Ptolemy* and others increaſed to 1163, *Ricciolus* to 1468, and *Bayer* to 1725: Dr. *Halley* 373 obſerved by him within the *Antarctick Circle*. *Hevelius*, from his own Obſervations, and thoſe of Dr. *Halley*, and the Antients, made a Catalogue of 1888 *Stars*; and Mr. *Flamſtead* has ſince made a Catalogue of no leſs than 3000 *Stars*, all from his own moſt accurate Obſervations. Of theſe 3000, it is true, there are many only viſible through a *Teleſcope*; nor does a good Eye ſcarce ever ſee more than a hundred at the ſame Time in the cleareſt Heaven: The Appearance of innumerable more frequent in clear winter Nights, arrives from our Sight's being deceived by their Twinkling, and from our viewing them confuſedly, and not reducing them to any Order. Yet for all this, the *Stars* are really almoſt infinite. *Riccioli* makes no Scruple to affirm, in his new *Almageſt*, that a Man who ſhould ſay there are above twenty thouſand Times twenty thouſand, would ſay nothing improbable; for a good Teleſcope directed to any Points of the Heavens, diſcovers Numbers, that are loſt to the naked Sight.

In the ſingle Conſtellation of the *Pleiades*, inſtead of ſix or ſeven *Stars* ſeen by the beſt Eye, Dr. *Hook* with a Teleſcope twelve Foot long, told ſeventy-eight; and with larger Glaſſes many more of the ſame Magnitudes. *F. de Reita*, a Capuchin, affirms, that he has obſerved above 2000 *Stars* in the ſingle Conſtellation of *Orion*. The ſame Author found above 188 in the *Pleiades*: And *Huygens* looking at the Star in the middle of *Orion*'s Sword; inſtead of one, found it to be twelve. *Galileo* found 80 in *Orion*'s Sword; 21 in the nebulous *Star* of his Head; and 36 in the nebulous *Star præſepe*.

I have ſo often mentioned *Conſtellation* in this Article, that I muſt explain here what's meant by *Conſtellation*, and what the *Conſtellations* are.

Constellation is an Aſſemblage or Syſtem of ſeveral *Stars*, expreſſed and repreſented under the Name and Figure of ſome animal or other Thing, called alſo an *Aſteriſm*.

The Antients portioned out the Firmament into ſeveral Parts, or *Conſtellations*, reducing certain Number of Stars under the Repreſentation of certain Images, in Order to aid the Imagination, and the Memory to conceive and retain their Number, Diſpoſition, and even to diſtinguiſh the Virtues which they attributed to them.

The Diviſion of the Heavens into *Conſtellations* is very antient, and in all likelyhood as old as *Aſtronomy* itſelf; at leaſt it was known to the moſt antient Authors extant, whether ſacred or profane. In the moſt antient Book of *Job* Mention is made of the Name of ſome of them; witneſs that ſublime Expoſtulation, *Canſt thou reſtrain the ſweet Influence of the* Pleiades, *or looſen the Hands of* Orion? And the ſame may be obſerved of the oldeſt among the Heathen Writers *Homer* and *Heſiod*.

The Diviſion of the Antients only took in the viſible Firmament, or ſo much as came under their Notice: This they diſtributed under 48 *Conſtellations*; twelve whereof took up the *Zodiack*; the Names they gave them are, *Aries*, *Taurus*, *Gemini*, *Cancer*, *Leo*, *Virgo*, *Libra*, *Scorpius*, *Sagittarius*, *Aquarius*, *Capricornus*, *Piſces*; from whence the Signs of the *Ecliptick* and *Zodiack* take their Names; though now no longer contiguous to the *Conſtellations*.

The other Stars on the Northern Signs of the *Zodiack*, were diſpoſed into 21 *Conſtellations*, viz. *Urſa major* and *minor*, *Draco*, *Cepheus*, *Bootes*, *Corona ſeptentrionalis*, *Hercules*, *Lyra*, *Cygnus*, *Caſſiopeia*, *Perſeus*, *Andromeda*, *Triangulum*, *Auriga*, *Pegaſus*, *Equuleus*, *Delphinus*, *Sagitta*, *Aquila*, *Ophiculus*, or *Serpentarius*, and *Serpens*; to which have been added ſince *Antinous*, and *Coma Berenices*.

The Stars on the Southern Side of the *Zodiack* were diſtributed into 15 *Conſtellations*; their Names *Cetus*, *Eridanus Fluvius*, *Lepus*, *Orion*, *Canis major* and *minor*, *Argo*, *Hydra*, *Crater*, *Corvus*, *Centaurus*, *Lupus*,

Lupus, *Æra*, *Corona Meridionalis*, and *Piſcis Auſtralis*: To which have been ſince added the following, *viz. Phœnix*, *Grus*, *Indus*, *Pavo*, *Piſcis Auſtralis*, *Piſcis volans*, *Toucan*, *Hydrus*, and *Xiphias*.

Of theſe *Conſtellations* the 15 laſt with the greateſt Part of *Argo*, *Navis*, *Centaurus* and *Lupus* are not viſible in our Horizon.

In theſe *Conſtellations* the Stars are ordinarily diſtinguiſhed by that Part of the Image wherein they are found. *Blayer* diſtinguiſhes them farther by the Letters of the *Greek* Alphabet; and many of them again have peculiar Names, as *Arcturus* between the Feet of *Bootes*; *Gemina* or *Lucida* in the *Corona Septentrionalis*; *Palilitium* in the *Bull's-Eye*; *Pleiades* in the Back, and *Hyades* in the Forehead of the *Bull*; *Caſtor* and *Pollux* in the Head of *Gemini*; *Capella*, with the *Hædi* in the Shoulder of *Auriga*, *Regulus*, or *Cor Leonis*; *Spica Virginis* in the Hand, and *Vindemiatrix* in the Shoulder of *Virgo*; *Antares*, or *Cor Scorpii*; *Fomahaut* in the Mouth of *Piſcis Auſtralis*; *Regel* in the Foot of *Orion*; *Sirius* in the Mouth of *Canis major*; and the *Pole-Star*, the laſt in the Tail of *Urſa minor*.

The other *Stars* not comprehended under theſe *Conſtellations*, yet viſible to the naked Eye, the Antients called *Informes*, or *Sporades*, ſome whereof the modern *Aſtronomers* have ſince reduced into new Figures or *Conſtellations*. Thus *Hevelius*, *v. gr.* between *Leo* and *Urſa minor*, makes *Leo minor*; and between *Urſa minor* and *Auriga*, over *Gemini*, makes *Lynx*, under the Tail of *Urſa major*, *Canes Venatici*, &c.

The Changes which have happened in the *Stars* are very conſiderable, contrary to the Opinion of the Antients, who held, that the Heavens and heavenly Bodies were incapable of any Change, the Matter thereof being permanent and eternal, infinitely exceeding the Hardneſs of Diamonds, and not ſuſceptible of any different Form; and in Effect, 'till the Time of *Ariſtotle*, and even two hundred Years afterwards, there had no Change been obſerved. The firſt was in the Year 125, before the Incarnation, when *Hipparchus* diſcovering a new *Star* to appear, was firſt induced to make a Catalogue of the *Stars*, that Poſterity, as we have obſerved, might perceive any future Changes of the like Kind.

In the Year 1572, *Tycho Brahe* obſerved another new Star in the *Conſtellation Caſſiopeia*, which was likewiſe the Occaſion of his making a new Catalogue. Its Magnitude at firſt exceeded that of the biggeſt of our Stars, *Sirius* and *Lyra*; it even equalled that of *Venus*, when neareſt the *Earth*, and was ſeen in fair Day-light. It continued ſixteen Months, toward the latter Part whereof it began to dwindle, and at laſt totally diſappeared, without any Change of Place in all that Time. *Leovicius* tells us of another Star appearing in the ſame *Conſtellation*, about the Year 905, which reſembled that of 1572; and quotes another antient Obſervation, whereby it appears that a new *Star* was ſeen about the ſame Place in 1264. Dr. *Keil* takes thoſe to have been all the ſame *Star*; and does not know but it may make its Appearance a-new 150 Years hence.

Fabricius diſcovered another new *Star* in the Neck of the *Whale*, which appeared and diſappeared ſeveral Times in the Years 1640 and 1662: Its Courſe and Motion is deſcribed by M. *Bouillaud*. *Simon Marius* diſcovered another in *Andromeda*'s Girdle in 1612 and 1613; though M. *Bouillaud* ſays it had been ſeen before in the 15th Century. Another was obſerved by *Kepler* in *Serpentarius*. Another of the third Magnitude in the Conſtellation *Cygnus*, near the Bill, in the Year 1601, which diſappeared in 1626, and was obſerved again by *Hevelius* in 1659, 'till the Year 1661, and again in 1666 and 1671, as a *Star* of the ſixth Magnitude.

It is certain from the antient Catalogues that many of the antient *Stars* are not now viſible. This is particularly notorious in the *Pleiades* or ſeven *Stars*, whereof ſix are now viſible to the Eye; a Thing long ago obſerved by *Ovid*. M. *Montaner*, in his Letter to the *Royal Society*, in 1670, obſerves that there are now wanting in the Heavens two *Stars* of the ſecond Magnitude, in the Stern of the Ship *Argo* and its Yard, which had been ſeen 'till the Year 1664. When they firſt diſappeared it is not known; but he aſſures us, that there was not the leaſt Glympſe of them in 1668. He adds, he has obſerved many more Changes in the fixed *Stars*, even to the Number of an hundred.

Theſe *Stars* which appear and diſappear by Turns, being always found to increaſe in Magnitude at their firſt Appearance, and to decreaſe as they begin to diſappear, and being likewiſe ſtill viſible through Teleſcopes, for ſome Time after they are loſt to the naked Eye, ſeem to be no more than Planets, performing their Periods about the fix'd Stars, as their reſpective Suns, (if it might be ſuppoſed that each *Star* is the Center of a Syſtem, and has Planets or Earths revolving round it, in the ſame Manner as round our Sun; *i. e.* has opake Bodies illuminated, warmed and cheriſhed by its Light,) unleſs we ſhould be rather inclined to Dr. *Keil*'s Opinion, *viz.* that the *Stars* loſe their Brightneſs, and diſappear, by becoming covered with *Maculæ* or Spots, ſuch as are frequently found to overſpread the Sun.

Some are of Opinion that thoſe temporary *Stars*, which upon their diſappearing have never been found to return again, are probably conjectured to be of the Number of *Comets*, which make long Excurſions from their Suns, or the Center of the upper Planetary Syſtems, *i. e.* from the fix'd Stars; returning too ſeldom to have their Returns perceived.

The fix'd Stars ſhine with their own Light, for they are much farther from the Sun than *Saturn*, and appear much ſmaller than *Saturn*; but ſince, notwithſtanding this, they are found to ſhine much brighter than *Saturn*, it is evident they cannot borrow their Light from the ſame Source as *Saturn* does, *viz.* the Sun: But ſince we know of no other luminous Body beſides the Sun, whence they might derive their Light, it follows that they ſhine with their own native Light.

From the Firmament or Heaven of the fixed Stars we'll deſcend, *gradually*, to the inferior Heavens, taking, in our Progreſſes, the *Comets* under our Conſideration.

Ariſtotle, *lib.* 1. *Meteor.* c. 7. falſly imagined that *Comets* were only a Kind of tranſient Fires or Meteors, conſiſting of Exhalations raiſed to the upper Region of the Air, and there ſet on Fire; far below the Moon's Courſe; but from the Time of *Tycho Brahe*, all *Aſtronomers* have been of Opinion, that *Ariſtotle* was miſtaken, and have all approved *Seneca*'s Sentiments, who, *lib.* 7. *natural. queſt. c.* 22. places a *Comet* among the eternal Works of Nature; and conſiders it as an heavenly Body, or Star, or Planet, placed in another Vortex ever ſince the Creation. Beſides it is incredible that bituminous and ſulphurous Exhalations could remain inflamed in the Air, for ſo long a Time, as we ſee a *Comet* appear; add to it, that a *Comet* has no *Parallax*, which is a convincing Proof of its immenſe Diſtance from us; for the Moon has a ſenſible *Parallax*. For Example:

Let the Earth be A, *Fig.* 2. in which two Spectators will be placed, *viz.* in B and C: He who will be in C, will ſee the Moon D in J, and *Mars* E in H; and he in B will ſee the Moon D in F, and *Mars* E in G. Therefore both will judge that the *Moon* and *Mars* do not exiſt in the ſame Part of the Heavens or Firmament, or near the ſame Stars; but will refer them to different Parts of Heaven, and to different Stars; and the nearer the Earth a Star is ſuppoſed to be, the greater will be the Diverſity of Aſpect. Hence if the *Star* be the remoteſt from the Earth, ſuch as is L, ſo that the Magnitude of the Earth, with Reſpect to that Diſtance, ſhould not be ſenſible, or be like a Point, then the Star will be ſeen in the ſame Place by both Spectators; which is the Reaſon why *Comets* have no *Parallax*, becauſe ſeen in the ſame Place from

from ſeveral Spectators, and from ſeveral Places, *viz.* from *London*, *Paris*, *Rome*, *Conſtantinople*, &c. therefore the *Comets* are at an immenſe Diſtance from us.

If any Body was placed in the Center of the World, he would ſee the right Place of a Star. As if the Earth was in the Center of the World, and a Perſon placed in that Center, the Moon would appear to him under thoſe Stars it is really placed; but he who inhabits the Superficies of the Earth, muſt ſee the Moon under other Stars, unleſs it be placed in its Vertical; in which Caſe, the Lines of the true and apparent Place concur. For Example,

Let the Center of the Earth be A, *Fig.* 2; and the Moon D; the Perſon placed in A, will ſee the Moon in E; and he in B, ſee it in D: For the Arch E D, is the Difference of the true and apparent Place, which is called *Parallax*. But if one of the Spectators be placed in A, and the other in C, to whom the Moon ſhould be *vertical*; then becauſe the Ray of the true, and the Ray of the apparent Place, coincide in the ſame Point, there will be no *Parallax* in the Moon, becauſe it will be referred in E, by both Spectators. Therefore, from a *Parallax*, the Diſtance of a Star from the Arch is inveſtigated; and where there is no *Parallax*, *i. e.* where the terreſtrial Semidiameter, or the Diverſity of Aſpect from which the *Parallax* is required, has no ſenſible Magnitude, with Reſpect to the Diſtance of ſome celeſtial Body, becauſe of its great Diſtance from the Earth; that celeſtial Body muſt be ſuppoſed far above the Planets of our *Vortex*; which is the Caſe of the *Comets*, which, as I have already obſerved, have no *Parallax*.

Hence *Anaxagoras*, and *Democritus*, *apud Ariſt. l.* 1. *Meteor. c.* 6. would have the *Comets* to be nothing elſe but an Aſſemblage of errant Stars. But in what Manner thoſe Stars could aſſemble in one Body, without the leaſt ſenſible Fiſſure? why their Conjunction and Diſſolution are not perceivable? how they are altogether ſuſceptible of the ſame Motion, every one of them having a different one before their Conjunction? is what we cannot underſtand. Therefore it would be ſtill better to ſay, with *Pythagoras*, and the *Pythagoreans*, that the *Comets* are ſome Planets, which, though offuſcated with the too great Radiancy of the Sun, and thereby hidden from us, are, nevertheleſs, ſome Time diſtanced from the Sun, and come in Sight.

Des Cartes, *Tert. part. Princip. num.* 119. conjectures, that *Comets* P, are only Stars, formerly fixed like the reſt, in the Heavens; but which becoming by Degrees covered with *Maculæ*, or Spots, and at length wholly robbed of their Light, cannot keep their Place, but are carried off by the *Vortices* of the circumjacent Stars; and in Proportion to their Magnitude and Solidity, moved in ſuch Manner, as to be brought nearer the Orb of *Saturn*, and thus coming within Reach of the Sun's Light, rendered viſible.

Bernoulli, in his Syſtem of *Comets*, ſuppoſes ſome primary Planet revolving round the Sun in the Space of four Years, and 157 Days; and at the Diſtance from his Body of 2583 Semidiameters of the *great Orbit*: This Planet, he concludes, either from its vaſt Diſtance, or Smalneſs, to be inviſible to us; but, however, to have, at ſeveral Diſtances from him, ſeveral *Satellites* moving round him, and ſometimes deſcending as low as the *Orbit* of *Saturn*; and that theſe becoming viſible to us, when in their *Perigæum*, are what we call *Comets*.

Others will have the Motion of *Comets* made in the excentrick Circle of the *Earth*, ſo that when they are in the *Apogee* of that Circle, they cannot be ſeen, becauſe of their great Diſtance from us; and are only viſible, when near the *Perigee*; and that it might very well happen, that even in the *Perigee* they are not viſible, ſince then they would be wrapp'd up in the Rays of the Sun, being never but in Day-time on the Horizon.

Some pretend to refute all theſe *Hypotheſes* from the very *Phænomena* of the *Comets*; objecting, 1. That thoſe *Comets* which move according to the Order of the Signs, either advance ſlower than uſual, or retrograde, a little before they diſappear, if the *Earth* be between them and the Sun; and more ſwiftly, if the *Earth* be ſituate in a contrary Part: On the contrary, thoſe which proceed contrary to the Order of the Signs, proceed more ſwiftly than uſual, if the *Earth* be between them and the Sun; and more ſlowly and go retrograde, when the *Earth* is in a contrary Part. 2. So long as their Velocity is increaſed, they move nearly in great Circles; but towards the End of their Courſe, deviate from thoſe Circles; and as often as the *Earth* proceeds one Way, they go the contrary Way. 3. That they move in Ellipſes, having one of their *Foci* in the Center of the Sun; and by *Radii* drawn to the Sun, deſcribe Areas proportionable to the Times. 4. That the Light of their Bodies, or *Nuclei*, increaſes in their Receſs from the *Earth* towards the Sun; and, on the contrary, decreaſes in their Receſs from the Sun towards the *Earth*. 5. That their *Tails* appear the largeſt, and brighteſt, immediately after their Tranſit through the Region of the Sun; and that they always decline from a juſt Oppoſition to the Sun towards thoſe Parts which the Bodies, or *Nuclei*, paſs over, in their Progreſs through their *Orbits*. 6. That this Declination, *cæteris paribus*, is the ſmalleſt when the Heads, or *Nuclei*, approach neareſt the Sun; and leſs ſtill, near the *Nucleus* of the *Comet*, than towards the Extremity of the *Tail*. 7. That the *Tails* are ſomewhat brighter, and more diſtinctly defined, in their convex, than in their concave Part; and that they always appear broader at their upper Extream, than near the Center of the *Comet*; which *Tails* are tranſparent, the ſmalleſt Stars appearing through them.

Some are of Opinion, that Sir *Iſaac Newton* ſolves all theſe *Phænomena*, by his ſuppoſing that the *Comets* are compact, ſolid, fixed, and durable Bodies; in one Word, a kind of Planets, which move in very oblique *Orbits*, every Way, with the greateſt Freedom, perſevering in their Motions, even againſt the Courſe and Direction of the Planets: Their *Tails* being a very thin, ſlender Vapour, emitted by the Head, or *Nucleus* of the *Comet*, ignited, or heated by the Sun. From whence they draw the following Concluſions, with him.

1. That it is evident, that the *Comets* which proceed according to the Order of the Signs, a little before they diſappear, muſt move more ſlowly, or appear retrograde, if the *Earth* be between them and the Sun; and ſwifter, if the *Earth* be in a contrary Part: On the contrary, thoſe proceeding againſt the Order of the Signs, *&c.* for ſince their Courſe is not among the fixed Stars, but among the Planets; as the Motion of the *Earth* either conſpires with them, or goes againſt them, their Appearance, with Regard to the *Earth*, muſt be changed, and, like the Planets, they muſt ſometimes appear ſwifter, ſometimes ſlower, and ſometimes retrograde. 2. When the *Comets* move the ſwifteſt, they muſt proceed in ſtrait Lines; but in the End of their Courſe decline, *&c.* becauſe in the End of their Courſe, when they recede almoſt directly from the Sun, the Part of the *apparent Motion* which ariſes from the *Parallax*, muſt bear a greater Proportion to the whole *apparent Motion*. 3. The *Comets* muſt move in *Ellipſes*, having one of their *Foci* in the Center of the Sun; becauſe they do not wander precariouſly from one fictitious *Vortex* to another, but, making a Part of the Solar Syſtem, return perpetually, and run a conſtant Round. 4. The Light of their *Nuclei* muſt increaſe in their Receſs from the Sun, and *vice verſa*; becauſe as they are in the Regions of the Planets, their Acceſs toward the Sun, bears a conſiderable Proportion to their whole Diſtance. 5. Their Tails muſt appear the largeſt, and brighteſt, immediately after their Tranſit through the Region of the Sun; becauſe then their Heads being the moſt heated, will emit the moſt Vapours; which Tails muſt ſtill decline from a ſtrict Oppoſition to the Sun, towards thoſe Parts which the Heads paſs over in their Progreſs through their *Orbits*; becauſe

all Smoak and Vapours emitted from a Body in Motion, tends upwards obliquely, ſtill receding from that Part towards which the ſmoaking Body proceeds. 6. That Declination will be ſtill the leaſt near the *Nucleus* of the *Comet*, and when the *Comet* is neareſt the Sun; becauſe the Vapour aſcends more ſwiftly near the Head of the *Comet*, than in the higher Extremity of its Tail; and when the *Comet* is at a leſs Diſtance from the Sun, than at a greater. 7. The Tail is brighter, and better defined, in its convex Part, than in its concave: Becauſe the Vapour in the convex Part, which goes firſt, being ſomewhat nearer and denſer, reflects the Light more copiouſly. The Tail muſt alſo appear broader towards the higher Extremity of the *Comet*, than towards the Head; becauſe the Vapour in a free Space perpetually rarefies and dilates. Laſtly, The Tail muſt be tranſparent, becauſe conſiſting of infinitely thin Vapour, *&c.*

There is no certain Time fixed for the Appearance of the *Comets*; for ſometimes many Years have elapſed in which we could diſcover none, and ſometimes ſeveral have appeared in the Space of two Months. The Part of the Heavens wherein they appear firſt, is not, likewiſe, determined; for ſome appear firſt towards the *Ecliptick*, and others towards the *Poles* of the World. Neither is the Time of the Duration of their Appearance fixed; for ſome are ſeen for a few Days only, others, on the contrary, for ſeveral Months.

All the *Comets* ſeem to have a diurnal Motion from Eaſt to Weſt, towards the *Earth*, and in that Senſe to deſcribe Circles parallel to the *Equator*. Beſides that apparent Motion they have in common with the other heavenly Bodies, they have another proper, and peculiar to them under the *Firmament*, which cannot be regularly determined; for ſome are carried to the Eaſt, ſome to the Weſt, and others otherwiſe.

The Celerity of this peculiar Motion is not equal in all the *Comets*, but is rather various and unequal; ſince ſome of them run ſeveral more Degrees of a great Circle than others; neither is the Celerity of the Motion of each *Comet* always equal: For the Arch B, which it runs each Day, is ſometimes greater, and ſometimes leſs, in ſuch Manner, however, that if ſeveral right Lines were drawn from the Center of the *Earth*, to be carried through the Places wherein the *Comet* is ſeen at that Hour, thoſe Lines would divide another right Line into almoſt equal Parts, which ſhould touch the Circle deſcribed by the *Comet*, in that Place where its Motion appears the moſt rapid. Neither is the Way they run through always equal, ſince ſome deſcribe a greater Space in the Heavens than others. But, however, let that Space be what it will, none, or very few, have been known to have deſcribed above one Half of the great Circle under the *Firmament*, *i. e.* to have run more than Half the Heavens.

When a *Comet* is ſeen to dart its Rays toward that Place of the Heavens where its Motion ſeems to carry it, thoſe Rays are called the *Beard* of the *Comet*; when, on the contrary, thoſe Rays are extended towards that Part of the Heavens whence its proper Motion ſeems to recede, they are called the *Tail* of the *Comet*; but when they are equally diſperſed on all Sides, ſome call it the *Hairs* of the *Comet*. Thus the *Comet* which was ſeen in 1664, at the Beginning of *December*, in the meridional Part of the World, to whoſe Reſpect the Sun was Eaſt, darting its Rays towards the Weſt, where its proper Motion inclined, was called *bearded*; being turned afterwards towards the Sun, it ſhewed its *Hairs*; and, laſtly, having the Sun on the Weſt, its Rays being then darted towards the Eaſt, formed a *Tail*.

Rohault does not believe that thoſe Rays, whereof the *Beard*, *Tail*, or *Hairs* of a *Comet* are imagined to be made, are produced of ſome particular Matter, accompanying the Body of the *Comet*; becauſe he ſuppoſes that there is not that Connection perceived, which ſhould be between that Matter and the Sun, on the Reaſon of the prodigious Diſtance which that Matter ſhould be obliged to extend to. Therefore he ſuppoſes that *Phænomenon* to proceed from the Rays of Light reflected by the Body of the *Comet*, *i. e.* from Reflection.

Apollonius Myndius was the firſt who took *Comets* for regular Stars; and ventured to foretel, that one Day the Periods, and Laws of their Motion, would be diſcovered. Aſtronomers, however, are ſtill divided on that Head; *Newton*, *Flamſteed*, *Halley*, and all the *Engliſh* Aſtronomers, ſeem ſatisfied of the Return of *Comets*. *Caſſini*, and others of the *French*, think it highly probable. *De la Hire*, and others, oppoſe it.

Thoſe on the affirmative Side, ſuppoſe the *Comets* to deſcribe Circles prodigiouſly eccentrick, inſomuch, as we can only ſee them in a very ſmall Part of their Revolution; out of this they are loſt in the immenſe Spaces; hid not only from our Eyes, but from our Teleſcopes. That little Part of their Circle next us, M. *Caſſini*, &c. have found to paſs between the *Orbits* of *Venus* and *Mars*.

M. *Caſſini* gives the following Reaſons for the Return of the *Comets*. 1. In conſidering the Courſe of the *Comets*, with Regard to the fixed Stars, they are found to keep a conſiderable Time in the Arch of a great Circle, *i. e.* a Circle whoſe Plane paſſes through the Center of the *Earth*; indeed, they deviate a little from it, chiefly towards the End of their Appearance; but this Deviation is common to them with the Planets. 2. *Comets*, as well as Planets, appear to move ſo much the faſter, as they are nearer the *Earth*; and when they are at equal Diſtances from their *Perigee*, their Velocities are nearly the ſame. 3. There are no different Planets whoſe *Orbits* cut the *Ecliptick* in the ſame Angle, whoſe Nodes are in the ſame Points of the *Ecliptick*, and whoſe apparent Velocity in their *Perigee* is the ſame: Of Conſequence, two *Comets*, ſeen at different Times, yet agreeing in all thoſe three Circumſtances, can only be one and the ſame *Comet*. And this were the *Comets* of 1577, and 1680, obſerved to do; and thoſe of 1652, and 1698: Not that this exact Agreement in theſe Circumſtances is abſolutely neceſſary to determine them the ſame *Comet*. M. *Caſſini* finds the Moon her ſelf irregular in them all: Accordingly, he is of Opinion, that there are ſeveral which diſagree herein, yet may be accounted the ſame.

In 1702 was a *Comet*, or rather the *Tail* of one, ſeen at *Rome*, which M. *Caſſini* takes to be the ſame with that obſerved by *Ariſtotle*, and that ſince ſeen in 1668; which would imply its Period to be 34 Years. Again, in *April* of the ſame Year 1702, a *Comet* was obſerved by Meſſieurs *Biancini* and *Maraldi*, ſuppoſed by the latter to be the ſame with that of 1664, both by reaſon of its Motion, Velocity, and Direction. M. *De la Hire* took it to have ſome Relation to another he had obſerved in 1698, which M. *Caſſini* refers to that of 1652: On this Suppoſition, its Period appears to be 43 Months, and the Number of Revolutions between 1652 and 1698, fourteen.

M. *De la Hire* propoſes one general Difficulty againſt the whole Syſtem of the Return of the *Comets*, which would ſeem to hinder any *Comet* from being a Planet; and it is this: That by the Diſpoſition neceſſarily given to their Courſes, they ſhould appear as ſmall at firſt, as at laſt, and always increaſe, till they arrive at their greateſt Proximity to the *Earth*; or if they ſhould chance not to be obſerved as ſoon as they become viſible, for want of Attention thereto, at leaſt it is impoſſible but they muſt frequently ſhew themſelves e're they have arrived at their full Magnitude and Brightneſs: But he adds, that none were ever yet obſerved till they had arrived at it.

Sir *Iſaac Newton* ſuppoſes, that as thoſe Planets which are neareſt the Sun, and revolve in the leaſt *Orbits*, are the ſmalleſt; ſo, among the *Comets*, ſuch as in their *Peribelion* come neareſt the Sun, are the ſmalleſt, and revolve in leſſer *Orbits*.

When any Body will determine the Place or Courſe of a *Comet*, he muſt obſerve the Diſtance of the

Comet from two fixed Stars, whoſe *Longitudes* and *Latitudes* are known: From the Diſtances thus found, he muſt calculate the Place of the *Comet* by *Trigonometry*. But if he will do it mechanically, and without any Apparatus of Inſtruments, he muſt obſerve four Stars round the *Comet*, ſuch, as that the *Comet* may be in the Interſection of the right Lines that join the two oppoſite Stars; which is eaſily found, by means of a Thread placed before the Eye, and extended over-againſt the Stars and *Comet*; for which Invention we are indebted to *Longomontanus*.

I ſhould be apt to believe, that the *Comets* proceed from nothing elſe but from ſome of the moſt ſubtle Particles of the firſt Element, left in the ſecond after their firſt Separation, of the ſame kind of thoſe which compoſe the fixed Stars; that thoſe Particles, as well by their own innate Velocity, as by the continual Agitation of the Atmoſphere, exiſting between both Elements, finding Means to diſengage themſelves, to diſunite and break the Texture of the hooked and tenacious Corpuſcles of the ſecond Element, they were wrapp'd in, and almoſt overwhelmed with, they all meet together in a *Focus*, wherein, by the Rapidity of their Motion, they form that accidental Light, to which we give the Name of *Comet*. That by the almoſt inſuperable Obſtacles which obſtruct their Reunion, and which they are obliged to conquer, loſing Part of their Vivacity, they do not appear in their *Focus*, with the ſame Light and Radiancy the fixed Stars are ſeen to move with in their *Orbits*. That their Formation being but accidental, and they being, as it were, but *detached Pieces* of the whole Mechaniſm of the Heavens, without whoſe Aſſiſtance they can preſerve their entire Symmetry; they cannot be ſuppoſed to have any regular Form, but will appear ſometimes bigger, ſometimes leſs, according to the greater or leſs Aſſemblage of the Particles they are compoſed of. That in the Progreſs from the Place they ſally out, to that of their Deſtination, leaving a Tract or Paſſage for others of the ſame Nature to follow them, thoſe Particles diſperſed throughout that whole Paſſage, form what we take for the *Tail* of the *Comet*; and what we conſider as the *Beard* and *Hairs* of the *Comet*, is nothing elſe but the different Poſition of thoſe Particles, before they are entirely directed toward forming themſelves into one ſingle Body, which Body exiſts no longer in the ſame Form, than while it is capable to oppoſe the frequent Aſſaults it receives from the whole Element it appears in; which is evident, from its gradual Diminution, proceeding from its being overwhelmed by Degrees, by the *ambient Particles*; which conquering, at laſt, accompliſhes its Diſſolution.

Having thus conſidered all the heavenly Bodies, which are ſuppoſed to be placed beyond our *Vortex*; we come next to thoſe placed within our *Vortex*, or Syſtem. Among thoſe, the SUN challenges the firſt Place, as the Soul of all the reſt, who, by his Force and Action, communicates all the Motion and Strength to the other heavenly Bodies. The Heat and Light of the *Sun* demonſtrate its being of a fiery Nature; as being a Part of the firſt Element, tempered by the Acceſſion of the Particles of the ſecond and third Element.

The fiery Nature of the *Sun*, is proved by its Rays being collected by concave Mirrors, or convex Lenſes, burning, conſuming, and melting the moſt ſolid Bodies, or elſe converting them into Aſhes. Wherefore as the Force of the Solar Rays is diminiſhed by their Divergency, in a duplicate *Ratio* of the Diſtances reciprocally taken; it is evident, their Force and Effect is the ſame, when collected by a burning Lens, or Mirror; as if we were at ſuch a Diſtance from the *Sun* where they were equally denſe. The *Sun*'s Rays, therefore, in the Neighbourhood of the *Sun*, produce the ſame Effects, as might be expected from the moſt vehement Fire: Conſequently the *Sun* is of a fiery Subſtance.

Hence it follows, that its Surface is every where fluid, that being the Condition of Flame. Indeed, whether the whole Body of the *Sun* be fluid, as ſome think, or ſolid, as others; we do not determine: But as there are no other Marks, whereby to diſtinguiſh Fire from other Bodies, but Light, Heat, a Power of burning, conſuming, melting, calcining, and vitrifying; we do not ſee what ſhould hinder, but that the *Sun* may be a Globe of Fire, like our's, inveſted with Flames. From the Nature, we proceed to

The Figure of the *Sun*, which is a Spheroid, higher under its *Equator*, than under the *Poles*; which is proved thus: The *Sun* has a Motion about its own *Axis*, and therefore the Solar Matter will have an Endeavour to recede from the Centers of the Circles wherein it moves, and that with the greater Force, as the Peripheries of the Circles are greater. But the *Equator* is the greateſt Circle, and the reſt towards the *Poles* continually decreaſe: Therefore the Solar Matter, though at firſt in a ſpherical Form, will endeavour to recede from the Center of the *Equator*, further than from the Centers of the *Parallels*. Conſequently, ſince the Gravity whereby it is retained in its Place, is ſuppoſed to be uniform throughout the whole *Sun*; it will really recede from the Center more under the *Equator*, than under any of the *Parallels*. And hence the *Sun*'s Diameter drawn through the *Equator*, will be greater than that paſſing through the *Poles*; and therefore its Figure is not perfectly ſpherical, but *ſpheroidical*.

According to the *Copernican Hypotheſis*, which is now generally received, and which has even Demonſtration on its Side, the *Sun* is the Center of the *Cometary* and *Planetary* Syſtems; round which, all the *Planets*, and our *Earth*, among the reſt, revolve, in different Periods, according to their different Diſtances from the *Sun*.

But the *Sun*, though thus eaſed of that prodigious Motion, whereby the Antients imagined him to revolve daily round our *Earth*; yet is not a perfect quieſcent Body; for it evidently appears, from the *Phænomena* of its *Maculæ*, or Spots, that he has a *Rotation* round its *Axis*, like that of the *Earth*, whereby the natural Days are meaſured, only ſlower. Some of theſe Spots have made their firſt Appearance near the Edge, or Margin of the *Sun*, and have been ſeen ſome Time after on the oppoſite Edge; whence, after a Stay of about 14 Days, they have re-appeared in their firſt Place, and taken the ſame Courſe over-again; finiſhing their entire Circuit in 27 Days Time: Which is hence deduced to be the Period of the *Sun*'s *Rotation* round its *Axis*. This Motion of the *Spots* is from Weſt to Eaſt, whence we conclude that of the *Sun*, to which the other is owing, to be from Eaſt to Weſt.

Beſides this *Rotation* of the *Sun* round his *Axis*, he appears as if he had an annual Motion round the *Earth*, whereby he is ſeen to advance, inſenſibly, towards the eaſtern Stars; though it be demonſtrated that there is no ſuch Thing, and that ſuch Appearance is occaſion'd by the annual Motion of the *Earth*.

What's worthy our Obſervation in this apparent annual Motion of the *Sun*, is, 1. That he always appears to move in the ſame *Plane*, or *Ecliptick* Line, and never to change his Courſe; and that the *Earth*'s Center is always inherent on the ſame *Plane*, while it accompliſhes its Courſe round the *Sun*; which is agreeable to this general Rule, that all impulſive Force muſt always operate according to the Direction of a right Line: And as the annual Motion of the *Earth* proceeds from a projectile Impulſion, according to a right Line, and from a perpetual Attraction towards the Center of the *Sun*, it is abſolutely neceſſary that the *Earth*, as well as the reſt of the *Planets*, ſhould form her Courſe on the ſame Plane, by a Line of Direction of an impulſive Force, and which ſhould paſs through the Center of the *Sun*.

2. That his Motion is inequable, though in the ſame *Ecliptick*; for a little after the *Vernal*, and ſome Time before the *Autumnal Equinox*, his Motion is moderately ſwift; but a little after the *Winter's Solſtice*, the ſame Motion is ſwifter; and after the *Summer's*

mer's Solſtice, ſlower. This Inequality of Motion is occaſioned by the *Earth*, not deſcribing a Circle round the *Sun*, but an *Ellipſis*.

3. That the *apparent Diameter* of the *Sun* is greater in *Winter*, while his Motion is ſwifter, than in *Summer*, while ſlower; becauſe as the *Earth*, as we have obſerved already, performs its Courſe in an *Ellipſis*, and in the ſame *Ellipſis* is always removed from the *Sun*, at an unequal Diſtance, as well when it aſcends from the *Perihelion* to the *Aphelion*, as when it deſcends from the *Aphelion* to the *Perihelion*; and as the *Earth* is in its *Perihelion* a little after the *Winter Solſtice*, and in its *Aphelion* a little after the *Summer Solſtice*, the *apparent Diameter* of the *Sun*, or of his reciprocally proportional *Diſtance* from the *Earth*, muſt be either *greater* or *leſſer*, as the *Diſtance* is *greater* or *leſſer*. Therefore it is found, towards the Beginning of the *Winter*, very great; *mediocre*, towards the Beginning of the *Spring*, and *Autumn*; and very ſmall about the Beginning of *Summer*.

4. That the *Ecliptick* being divided into two Parts by the *equinoctial Points*, the *Sun* ſtays longer in its northern Part, than in the ſouthern Part; that is to ſay, the *elliptical Orbit* of the *Earth* is divided by the *equinoctial Points* into two unequal Parts; for the *Perihelion* is not at a very great Diſtance from the *Winter Solſtice*: Therefore the *equinoctial Points* muſt almoſt coincide, not with the great *Axis*, but with the right Side, and thereby render the Spaces unequal. Therefore the *apparent Motion* of the *Sun*, which in equal Times deſcribes equal Spaces, muſt be unequal, and appear to ſtay ſeveral Days longer in the ſix *northern*, than in the *ſouthern Signs*; and though this Difference be of almoſt eight Days, it nevertheleſs will decreaſe, in the ſucceeding Years, ſo as to be reduced to nothing at laſt; and again decreaſe and increaſe, by Courſe, as long as the annual Motion will laſt.

5. That, however, the Space of the entire annual Revolution, which we call *Year*, is equal to each other, and conſiſts of 365 Days, 5 Hours, 49 Minutes; ſince whatever be the Inequality of the Parts, when compared to each other, there is nothing taken, thereby, from the whole Revolution: For the whole Space of the ſame *Ellipſis* is the ſame, and we begin to enumerate the Areas from what Place ſoever, becauſe the Beginning and the End of the Numeration will be the ſame. There is, however, ſome Inequality betwixt the Time of the *Anomaly* reſtored, or of the Revolution from the Point of the *Ellipſis*, to the ſame Point, (which is equal to the *Starry Year*) and the Time of the *Tropical Year*; for the *Starry Year*, or the Revolution of the *Earth* from a fix'd Star to the ſame Star, is not always of the ſame Magnitude with the *Tropical Year*.

6. That the *Obliquity* of the *Ecliptick*, or the Angle wherein it cuts the *Equator*, is uſually fixed at 23° 29′; which, therefore, is the greateſt *Declination* of the *Ecliptick* from the *Equator*.

The Method of obſerving the greateſt *Declination* of the *Ecliptick* is thus: About the Time of one of the *Solſtices*, obſerve the *Sun*'s *Meridian Altitude*, with the utmoſt Care, for ſeveral Days ſucceſſively; from the greateſt *Altitude* obſerved, ſubſtract the *Height* of the *Equator*, the Remainder is the greateſt *Declination* in the *ſolſtitial Point*. *Ricciolus*, *E. gr.* at *Bologna*, in the Year 1646, obſerved the *Sun*'s *Meridian Altitude*, on the 20th of *June*, to be 68° 59′ 55″; on the 21ſt, 69° 0′ 10″; and on the 22d, 68° 59′ 55″. The greateſt, then, was, 69° 0′ 10″; from which the *Altitude* of the *Equator*, 45° 29′ 50″, being ſubſtracted, left 23° 30′ 20″, for the greateſt *Declination*.

It has been a Matter of great Diſpute among the late *Aſtronomers*, whether the *Obliquity of the Ecliptick* be fixed or moveable? It is certain the Obſervations of the antient *Aſtronomers* repreſent it conſiderably greater than thoſe of the Moderns: Whence *Purbachius*, *Reinboldus*, *Regiomontanus*, *Copernicus*, *Rheticus*, *Longomontanus*, *Tycho*, *Snellius*, *Lanſbergius*, *Bullialdus*, and others, have concluded it variable.

To determine the Point, the Obſervations of the *Aſtronomers* of all Ages, have been collected together; the chief of which are: That of *Pytheas* in the Year of *Chriſt* 324, which makes it 23° 52′ 41″: That of *Eratoſthenes*, in 230, 23° 51′ 20″: And that of *Hipparchus* in the Year before *Chriſt* 140, 23° 51′ 20″: That of *Ptolemy* in the Year after *Chriſt* 140, 23° 51′ 20″: Of *Albategnius* in 880, 23° 35′: *Regiomontanus* in 1460, 23° 30′: *Waltherus* in 1476, 23° 30′: *Copernicus* in 1525, 23° 28′ 24″: *Rothmannus* and *Byrgius* in 1570, 23° 30′ 20″: *Tycho* in 1587, 23° 30′ 22″: *Kepler* in 1627, 23° 30′ 30″: *Gaſſendus* in 1636, 23° 31′: *Ricciolus* in 1646, 23° 30′ 20″: *Helvelius*, 23° 30′ 20″: *Marton*, 23° 30′: And *De La Hire* in 1702, 23° 29′.

Upon the whole, though the oldeſt Obſervations make the Obliquity the greateſt, yet it appears to be immutable; for it was by Miſtake that *Eratoſthenes* concluded, from his Obſervations, the greateſt Declination to be 23° 51′ 20″; from the ſame Obſervations he ſhould only have made it 23° 31′ 5″; as is ſhewn by *Ricciolus*; and the like Overſight has been found by *Gaſſendus*, and *Peireſcius* in the Obſervation of *Pythias*, which Miſtakes of *Eratoſthenes* and *Pythias* were retained by *Hypparchus* and *Ptolemy*; and gave Occaſion to the aforementioned Authors to conclude that the Obliquity was continually decreaſing. Yet the Chevalier *de Louville*, who has examined the Merit of the Cauſe with great Attention, is of another Sentiment; the Reſult of his Reſearches he gives us in the Memoirs of the *Royal Academy*, for the Year 1716, *viz.* that the *Obliquity of the Ecliptic* diminiſhes at the Rate of a Minute in 100 Years. The Antients had no Regard to any Refractions in their Obſervations: And beſides made the *Sun*'s Horizontal *Parallax* 3′; whereas the modern *Aſtronomers* ſcarce make it 10″. Theſe two Inaccuracies have a very ill Effect on their Obſervations; which M. *de Louville* is obliged to free them of, e'er he can build on them.

According to an antient Tradition of the *Egyptians*, mentioned by *Herodotus*, the *Ecliptick* had antiently been perpendicular to the *Equator*: This Notion they were led into, by obſerving, for a long Series of Years, that the *Obliquity* was continually diminiſhing; or which amounts to the ſame, that the *Ecliptick* was continually approaching to the *Equator*: For hence they took Occaſion to ſuſpect that thoſe two Circles, in the Beginning, had been as far off each other as poſſible. *Diod. Siculus* relates, that the *Chaldeans* reckoned 403000 Years from their firſt Obſervations to the Time of *Alexander*'s entring *Babylon*. This enormous Account may have ſome Foundation, ſuppoſing the *Chaldeans* to have built on the Diminution of the Obliquity of the *Ecliptick* of a Minute in 100 Years. M. *de Louville* taking the Obliquity, ſuch as it muſt have been at the Time of *Alexander*'s Entrance into *Babylon*, and going back to the Time, when the *Ecliptick*, at that Rate, muſt have been perpendicular to the *Equator*, actually finds 402942 *Egyptian* or *Chaldean* Years, which is only fifty Years ſhort of the former Epocha. In the general there is no Way of accounting for the fabulous Antiquity of the *Egyptians*, *Chaldeans*, &c. ſo probable, as from the Suppoſition of long Periods of very ſlow celeſtial Motions, whereof they had obſerved a little Part, and thence calculated the Beginning of the Period; making the World and their own Nation to commence together. If M. *de Louville*'s Syſtem be true, in 140000 Years more, the *Ecliptick* and *Equator* muſt coincide and mix in one.

But the moſt eſſential, and the moſt worthy our Obſervation of all the *Sun*'s *Phenomena*, is his *Parallax*, either Diurnal or Monthly, ſince thereby we diſcover his true Diſtance, and his true Magnitude, and with it the true Diſtances and Magnitudes of the other Planets.

The great Diſtance of the *Sun* renders his *Parallax* too ſmall, to fall even under the niceſt immediate Obſervation: Indeed many Attempts have been made both by the Antients and Moderns; and many Methods

thods invented for that Purpoſe. The *Firſt*, that of *Hipparchus*, followed by *Ptolemy*, *&c.* was founded on the Obſervation of *Lunar Eclipſes*. The *Second* was that of *Ariſtarchus*, whereby the Angle ſubtended by the Semidiameter of the Moon's Orbit ſeen from the *Sun*, was ſought from the *Lunar Phaſes*: But theſe both proving deficient, *Aſtronomers* are forced to have Recourſe to the *Parallaxes* of the Planets nearer us, as *Mars* and *Venus*; for from their *Parallaxes* known, that of the *Sun*, which is inacceſſible by any direct Obſervation, is eaſily deduced. For from the Theory of the Motion of the Earth and Planets, we know at any Time the Proportion of the Diſtances of the *Sun* and *Planets* from us; and the Horizontal *Parallaxes* are in a reciprocal Proportion to thoſe Diſtances: Knowing therefore the *Parallax* of a Planet, that of the *Sun* may be found from it. Thus *Mars* when oppoſite to the *Sun*, is twice as near as the *Sun* is: His *Parallax* therefore will be twice as great as that of the *Sun*: And *Venus*, when in her inferior Conjunction with the *Sun*, is ſometimes nearer than he is; her *Parallax* therefore is greater in the ſame Proportion.

Thus from the *Parallaxes* of *Mars* and *Venus*, *Caſſini* found the *Sun*'s *Parallax* to be ten Seconds, which implies his Diſtance to be 22000 Semi-Diameters of the Earth. In an Obſervation of the Tranſit of *Venus* over the *Sun*, which will be ſeen in *May* 1761. Dr. *Halley* has ſhewn a Method of finding the Sun's *Parallax*, and Diſtance to a five hundredth Part of the whole.

Before we proceed to the Obſervations of the *Moon* and the other Planets, it is very proper we ſhould explain what is here underſtood by Planets, their Diſtinction, *&c.*

PLANET, in *Aſtronomy*, is a celeſtial Body, revolving round the *Sun* as a Center, and continually changing its Poſition with Reſpect to the other Stars, whence its Name πλανήτης, Wanderer, in Oppoſition to a Star which remains fixed.

The *Planets* are uſually diſtinguiſhed into *Primary* and *Secondary*.

The *Primary Planets* called alſo ſimply, and by Way of Eminence, *Planets*, are thoſe which move round the *Sun* as their proper Center; and are again ſubdivided into ſuperior and inferior *Planets*. The Superiors are thoſe further off the *Sun* than our Earth is. Such are *Mars*, *Jupiter*, and *Saturn*. The Inferior are thoſe nearer the *Sun* than our Earth is, and ſituate between the Earth and the Sun. Such are *Venus* and *Mercury*.

Secondary Planets, are ſuch as move round ſome *primary Planets*, as their reſpective Center, in the ſame Manner as the *primary Planets* do round the *Sun*. Such are the *Moon* moving round our Earth; and thoſe others moving round *Saturn* and *Jupiter*, properly called *Satellites*.

Though the *Moon* be ranked here among the *ſecondary Planets*, we'll nevertheleſs give her the Preference, becauſe being nearer us ſhe appears the greateſt and moſt enlightened of all the other *Planets*.

The MOON is a dark opake and ſpherical Body, which, though called in the Scripture, *Gen.* c. i. v. 16. a great Luminary, has no Light of itſelf, but only ſhines with that ſhe receives from the *Sun*; whence only that half turned towards him is illuminated; the oppoſite one remaining in its native Darkneſs. The Face of the *Moon* viſible on our Earth is that Part of her Body turned towards the Earth; whence according to the various Poſitions of the *Moon*, with regard to the *Sun* and Earth, we obſerve different Degrees of Illumination; ſometimes a large, and ſometimes a leſs Portion of the enlightened Surface being viſible, which different Degrees of Illumination proceed alſo from the Superficy of the *Moon* being rough, uneven, and not ſmooth; whence *Hevelius* and *Ricciolus* conclude, that ſome Parts of the *Moon* are high, like Mountains and Rocks, and others low and level, like Valleys, Lakes, Seas, *&c.* pretending that thoſe Mountains, and high Rocks, ſhadow the various Parts of the Earth, according to the various Aſpect of the Sun. That is to ſay, if the Sun be Eaſt with Reſpect to the *Moon*, then the Mountains of the *Moon*, being illuminated on the Eaſt, will ſpread the Shadow towards the Weſt. Likewiſe, if the Sun be Weſtward, the ſame Mountains being illuminated Weſtward, will ſpread the Shadow Eaſtward.

But, however, ſome Aſtronomers will not have us imagine, that thoſe low, level, and ſhadow'd Parts of the *Moon* are of the ſame Nature with our Seas, Rivers, Lakes, *&c.* Since they pretend that there is no Atmoſphere round the *Moon*, like that raiſed round the Earth, from the Vapours of our Seas and Rivers; for, ſay they, when *Saturn* diſappears by the Interpoſition of the *Moon*, or ſuffers an Eclipſe, he is not obſerved to ſuffer any Mutation in the Ingreſs or Egreſs of the Shadow of the *Moon*, which ſhould happen, if the *Moon* had an Atmoſphere, different from the Æthereal Subſtance, and which would produce ſuch a *Penumbra* as that we obſerve in an Eclipſe of the *Moon*. For then *Saturn* would be obſerved conſiderably darkened by the *Penumbra* of the Atmoſphere, before he could enter the real Shadow of the Earth; ſince in a Total Eclipſe of the *Moon*, that dark Colour obſerved in the *Moon*, proceeds from the Refraction of the *Sun*'s Rays, in the Atmoſphere of the Earth.

Others, like *Melthlinus*, *Kepler*, *Galilæo*, &c. encompaſs the *Moon* with a heavy and elaſtick Atmoſphere, wherein Vapours, and other Exhalations aſcend, and whence they return in Form of Dew and Rain, which they ſuppoſe to be that lucid Ring they diſcover the *Moon* encircled with, and parallel to her Periphery, in a total Eclipſe of the *Sun*. *Kepler* obſerved that Ring at *Naples* and *Antwerp* in an Eclipſe which happened in 1605; *Wolfius* in another in 1606 at *Leipſick*: The ſame was obſerved in the great Eclipſe in 1713. Hence they conclude, that there is ſome Fluid about the *Moon*, which correſponds to her Figure, and which both reflects and refracts the *Sun*'s Rays; and hence alſo that this Fluid is denſer below near the *Moon*'s Body; and rarer above. Now as the Air which encompaſſes our Earth is ſuch a Fluid, it is manifeſt, ſay they, there is Air above the *Moon*; and ſince the different Denſity of the Air depends on its different Gravity and Elaſticity, no doubt the different Denſity of the Lunar Air has the ſame Cauſes. We have obſerved, continue they, the Lunar Air is not always equally clear and tranſparent: That ſometimes it changes the ſpherical Figures of the Stars into Ovals; and in the ſeveral total Eclipſes we have alſo obſerved a trembling in the *Moon*'s Limb, immediately before Immerſion, with an Appearance of thin light Smoke flying over it during Immerſion. And hence as theſe ſame *Phænomena* are obſerved in our Air, when full of Vapours, it is pretty plain, conclude they, at the Time when thoſe *Phænomena* are obſerved in that of the *Moon*, it is full of Vapours and Exhalations. And *Laſtly*, Since at other Times the *Lunar Air* is clear and tranſparent, the Vapours muſt have been precipitated on the *Moon*; and therefore either Dew or Rain, or Snow have fallen.

The other Proofs to ſupport their Opinion of the *Moon*'s Atmoſphere are, that the *Moon* ſometimes diſappears in a clear Heaven, ſo as not to be diſcoverable by the beſt Glaſſes; little Stars of the fifth and ſixth Magnitude all the Time remaining viſible. *Kepler* ſays that he has obſerved this *Phænomenon* twice, *viz.* in 1580 and 1583. *Hevelius* did the ſame in 1620. *Ricciolus* and other *Jeſuits* at *Bologna*, and many People throughout *Holland* obſerved the like, *April* 14, 1642; yet at *Venice* and *Vienna* ſhe was all the Time conſpicuous. *December* 23, 1703, there was another total Obſcuration. At *Arles* ſhe firſt appeared of a yellowiſh Brown; at *Avignon* ruddy and tranſparent, as if the *Sun* had ſhone through; at *Marſeilles* one Part was reddiſh, the other very duſky; and at length, though in a clear Sky, wholly diſappeared. Here it is evident, ſay they, that the Colours appearing different at the ſame Time, do not belong to the *Moon*; but that they are occaſioned by an Atmoſphere around her, variouſly diſpoſed in this and

that Place, for refracting of these or those colour'd Rays.

Cassini frequently observed *Saturn*, *Jupiter*, and the fix'd Stars, when hid by the *Moon*, near her Limb, whether the illuminated or dark one, to have their circular Figure, as we have mention'd already, chang'd into an oval one; and in other *Occultations* found no Alteration of Figure at all. In like manner, the *Sun* and *Moon* rising in a vaporous Horizon, do not appear circular, but elliptical. Hence, as we know, by sure Experience, (say those who contend for an Atmosphere of the *Moon*) that the circular Form of the *Sun* and *Moon* is only chang'd into an elliptical one by Means of the Refraction in the vapoury Atmosphere; it is pretty apparent, that at the Time when the circular Figure of the Stars is thus chang'd by the *Moon*, there is a dense Matter encompassing the *Moon*, wherein the Rays emitted from the Stars are refracted, and that at other Times, when there is no Change of Figure, this Matter is wanting.

Having thus form'd the *Moon* on the same Plan with our *Earth*, and over-stock'd it with Mountains, (which *Ricciolus* was pleas'd to distinguish by the Names of celebrated Astronomers, having himself taken the Height of that which he calls St. *Catherine*, and found it of nine *English* Miles) with Vallies, Forests, Seas, Rivers, *&c.* having likewise encompass'd it with an Atmosphere, which they are pleas'd to resolve into *Rain*, *Mists*, *Frost*, *Snow*, &c. according to the different Seasons of the Year, (for there must be, likewise, in the *Moon*, a Vicissitude of Seasons, and Variety of Climates) considering, at last, that Nature produces nothing in vain; that Dew and Rain fall on our *Earth*, to make Plants vegetate; and that Plants take Root, grow, produce Seeds and Fruits for Animals to feed on; in order that Nature should not be frustrated in her Designs, they have plac'd Animals in the *Moon*; reasonable, as well as irrational ones. Though they have not been capable, yet, notwithstanding their nicest Observations, to discover their Stature, none of them daring to venture to take a Trip into those Climates, to inform us of the Fertility of the Soil, the Product of the Country, of the Manners, Virtues, Vices, Passions, Affections of the Inhabitants; of the Form of their Government; of their Religion, if divided into several different Sects, or if they all adore a supreme Being, in the same Manner, and with the same Ceremonies; if their Priests content themselves with instructing those committed to their Care, in their Duty to God, and to their Neighbours, without interfering in State Affairs; or if they do not rather turn the Chair of Truth into a political *Rostrum*. If Hypocrisy is there a Mask for Religion; and if Perfidy, Falshood, Deceit, Treachery, *&c.* are as much in Vogue, under that Hemisphere, as they are under our's; if Bravery and Courage are as rare to be met with in their Armies, and Modesty and Virtue among the Fair Sex; if Idolatry in the Sanctuary, Venality in the Employments, Corruption in the Legislature, unfair Dealing in the Commerce, *&c.* are banish'd from among them? But how could they inform us of all those Particulars, since they never venture further into those Territories, than the Length of a *Telescope* will allow? Therefore, could we not very well believe, that what they are pleas'd to relate of that pretended Empire of the *Moon*, is all chimerical, and fictitious, since not supported by Reason, nor Authority; and has been invented by those who delight in Paradoxes and Obscurity.

From the *Nature* and *Furniture* of the *Moon*, we'll proceed to her various *Motions*.

Cassini is of Opinion, that the *Moon* revolves, every Month, round her proper *Axis*; with the same Face always turn'd towards the Earth; which can be easily understood, if we consider that a Man who runs round the Circumference of a Circle he has describ'd on an *Area*, always looks on the Center of that Circle, since in that whole Course he must revolve round himself.

2. The *Moon* is observ'd to be carried every Day, with the rest of the heavenly Bodies, from East to West.

3. The *Moon* advances, every Day, very near thirteen Degrees, from West to East; so that she finishes, or accomplishes her Course in the Space of 27 Days, and almost 8 Hours; which Interval, we call a *Periodical Month*; because then the *Moon*, mov'd from West to East, accomplishes her Period, *i. e.* from a determinate Part of the Heavens, to the same, or returns from one fix'd Star, to the same fix'd Star. But if we compare the *Moon* with the Sun, who does not remain, like a fix'd Star, in the same sensible Place, but every Day runs almost a Degree in the *Zodiack*, from West to East; she is longer in passing from one Conjunction to another, than in returning from a determinate Point of the Heavens to the same Point: Therefore as the Sun will be advanc'd 26 Degrees, or thereabouts, in the Space of a *Periodical Month*, the *Moon* must add two Days, or more, to the *Periodical Month*, in order to compleat the *Synodical Month*, and overtake the Sun, *i. e.* the Space from one *Syzygy* to the other: Whence the *Synodical Month* consists of 29 Days, 12 Hours, 44 Minutes, and 3 Seconds; though commonly the Minutes and Seconds are neglected, and the *Synodical Lunar Months* are reckon'd to consist alternately of 29 and 30 Days.

However, this Motion of the *Moon* does not describe a perfect Circle; for it is an *elliptical*, or approaching to the *elliptical*. For if we follow *Des Cartes*'s Hypothesis, the *Vortex* of the *Moon* being press'd on both Sides by *Mars* and *Venus*, must be *elliptical*. Hence the *Moon* occupies a lesser Diameter of that *Vortex* near the *Syzygies*, *i. e.* near the Conjunction and Opposition with the Sun; and a greater, when near the Quadratures.

As the *Plane* of the *Moon*'s *Orbit*, and the *Plane* of the *Ecliptick*, cut each other in a right Line, as, and in the same Manner as the same *Ecliptick* divides the *Equator* in the *Equinoctial Points*; hence ensues, that they are inclin'd to each other in an Angle of about five Degrees. The Points of those *Intersections* are call'd *Nodes*, by *Ptolemy*; whereof that where the *Moon* ascends above the *Plane* of the *Ecliptick* northward, is call'd the *Ascending Node*, and the *Head of the Dragon*; and the other, the *Descending Node*, and the *Dragon's Tail*; and the Interval of Time between the *Moon*'s going from the *Ascending Node*, and returning to it, a *Dracontick Month*.

If the Line of the *Nodes* was immoveable, that is, if it had no other Motion but that whereby it is carried round the Sun, it would still look towards the same Point of the *Ecliptick*, *i. e.* would always keep parallel to it self; but it is found by Observation, that the Line of the *Nodes* constantly changes Place, and shifts its Situation from East to West, contrary to the Order of the Signs, and by a retrograde Motion finishes its Circuit in about 19 Years; in which Time each of the *Nodes* returns to the Point of the *Ecliptick* whence it before receded. Hence it follows, that the *Moon* is never precisely in the *Ecliptick*, but twice each Period, *viz.* when she is in the *Nodes*; throughout the rest of her Course she deviates from it, being nearer or further from the *Ecliptick*, as she is nearer or further from the *Nodes*.

We call the *Moon*'s Distance from the *Nodes* her *Latitude*, which is measur'd by an Arch of a Circle drawn through the *Moon*, perpendicular to the *Ecliptick*, and intercepted between the *Moon* and the *Ecliptick*. The *Moon*'s *Latitude*, when at the greatest, never exceeds 5 Degrees, and about 18 Minutes; which *Latitude* is the Measure of the Angles of the *Nodes*.

M. *Cassini* observes, that while the *Moon* is performing her Revolution round the Earth, she varies her Distance from it, in three different Manners. For, 1. She runs every Day its *Apoger*, 6 Minutes, 42 Seconds, towards the East, and her *Excentricity* contains 42 Parts of a *mille*, into which the Semidiameter of the *Orbit* of the *Moon* is suppos'd to be divided.

This

This *Excentricity* is leſs, when the Sun is at an equal Diſtance from the *Moon's Perigee* and *Apogee*; but when the Sun approaches nearer the *Moon's Apogee* or *Perigee*, that *Excentricity* increaſes; and when the Sun is exiſtant in the *Moon's Apogee* or *Perigee*, the leſſer or ſimple *Excentricity* is increas'd by a half Part of it. The Space of Time wherein the *Moon*, going from the *Apogee*, returns to it again, is call'd the *Anomaliſtick Month*.

Tycho Brahe has diſcover'd, that the *Moon* changes her Motion, according to her different Diſtance from the *Syzygies*, *i. e.* from Oppoſition, or Conjunction. That in the firſt Quarter, that is, from the Conjunction to her firſt Quadrature, ſhe abates ſomewhat of her Velocity; which in the ſecond Quarter ſhe recovers: In the third Quarter ſhe again loſes; and in the laſt again recovers. This *Tycho* call'd the *Moon's Variation*.

There are other very conſiderable Irregularities in the *Moon's* Motion, in that of her *Apogee*, and in the *Nodes*: For when the *Earth* is in its *Aphelion*, the *Moon* is in her *Aphelion* likewiſe; in which Caſe, ſhe quickens her Pace, and performs her Circuit in a ſhorter Time: On the contrary, when the *Earth* is in its *Perihelion*, the *Moon* is ſo too; and then ſhe ſlackens her Motion; and thus revolves round the *Earth* in a ſhorter Space when the *Earth* is in its *Aphelion*, than when in its *Perihelion*: So that the *Periodical Months* are not all equal.

The Irregularity of the *Moon's Apogee* is diſcover'd by its being found to move forwards when it coincides with the Line of the *Syzygies*, and backwards, when it cuts that Line at right Angles. Nor is this Progreſs and Regreſs in any Meaſure equal; in the Conjunction and Oppoſition it goes briſkly forwards, and in the Quadratures moves either ſlowly forwards, ſtands ſtill, or goes backward.

The Motion of the *Nodes* is not uniform; but when the Line of the *Nodes* coincides with that of the *Syzygies*, they ſtand ſtill; when the *Nodes* are in the Quadratures, *i. e.* when their Lines cut that of the *Syzygies* at right Angles, they go backward, from Eaſt to Weſt; and this Sir *Iſaac Newton* ſhews, with the Velocity of 16″ 19‴ 24⁗ in an Hour.

Note, That SYZYGY, (from the *Greek* συζυγία, *Conjunctio*) is a Term equally us'd for the *Conjunction* and *Oppoſition* of a Planet with the Sun. On the *Phænomena* and Circumſtances of the *Syzygies*, a great Part of the *Lunar Theory* depends. For, 1. The Force which diminiſhes the Gravity of the *Moon* in the *Syzygies*, is double that which increaſes it in the *Quadratures*: So that in the *Syzygies* the Gravity of the *Moon* from the Action of the Sun, is diminiſh'd by a Part, which is to the whole Gravity, as 1 to 89,36; for in the *Quadratures* the Addition of Gravity is to the whole Gravity, as 1 to 178,73.

2. In the *Syzygies* the diſturbing Force is directly as the Diſtance of the *Moon* from the *Earth*, and inverſly as the Cube of the Diſtance of the *Earth* from the Sun. And as the *Syzygies* the Gravity of the *Moon* towards the *Earth*, receding from its Center, is more diminiſh'd, than according to the inverſe *Ratio* of the Square of the Diſtance from that Center. Hence, in the Motion of the *Moon* from the *Syzygies* to the *Quadratures*, the Gravity of the *Moon* towards the *Earth* is continually increas'd, and the *Moon* is continually retarded in its Motion; and in the Motion from the *Quadratures* to the *Syzygies*, the *Moon's* Gravity is continually diminiſh'd, and its Motion in its *Orbit* accelerated.

3. Further, in the *Syzygies* the *Moon's Orbit*, or Circle round the *Earth*, is more convex, than in the *Quadratures*; for which Reaſon, the *Moon* is leſs diſtant from the *Earth* at the former, than the latter. When the *Moon* is in the *Syzygies*, her *Apſides* go backwards, or are retrograde. When the *Moon* is in the *Syzygies*, the *Nodes* move *in antecedentia* faſteſt; then ſlower and ſlower, till they become at Reſt when the *Moon* is in the *Quadratures*.

Laſtly, When the *Nodes* are come to the *Syzygies*, the Inclination of the Plane of the *Orbit* is leaſt of all. Theſe ſeveral Irregularities are not equal in each *Syzygy*, but all ſomewhat greater in the *Conjunction*, than the *Oppoſition*.

Note alſo, That the QUADRATURE *fig.* 7. of the *Moon*, is her Aſpect, or Situation, when ſhe is 90° diſtant from the Sun. Or her *Quadrature* is when ſhe is in a middle Point of her *Orbit*, between the Points of *Conjunction* and *Oppoſition*, which happens twice in her Revolution, *viz.* in the firſt and third Quarters.

When the *Moon* is in her *Quadrature*, ſhe exhibits that *Phaſis* which we call the *Half Moon*, *i. e.* ſhe ſhines with juſt Half her Face, and is ſaid to be biſſected, or *dichotomized*. It is very difficult to fix the preciſe Moment, when the *Moon* is biſſected, or in her true *Dichotomy*. Obſervation informs us, that when ſhe is 30 Minutes diſtant from the *Quadratures*, ſhe appears biſſected; but ſhe appears ſo too in the *Quadratures* themſelves, and ſometimes afterwards, as *Ricciolus* acknowledges, in his *Almageſt*. So that ſhe appears *dichotomized*, or cut in two, at leaſt for the Space of a whole Hour; in which Time, any Moment may be taken for the true Point of *Dichotomy*, as well as any other. But the infinite Number of Moments of Time, give an infinite Diverſity of Diſtances. The Moment in which the true *Dichotomy* happens, being thus uncertain, but it being granted, withal, that it happens before the *Quadrature*; *Ricciolus* takes the middle Point between the *Quadrature* and the Time when it is firſt dubious whether the *Moon* be *dichotomized*, or not, for the true *Dichotomy*.

Aſtronomers determine the Period of the Moon's Revolution round the Earth, or the *Periodical Month*, and the Time between one Oppoſition and another, or the *Synodical Month*, by computing the Time between two Eclipſes, or Oppoſitions; and dividing this, by the Number of Lunations that have paſs'd in the mean Time: Hence they find the Quotient to be the Quantity of the *Synodical Month*. They likewiſe compute the Sun's mean Motion during the Time of the *Synodical Month*, and add this to the entire Circle deſcrib'd by the *Moon*. Then, as the Sum is to 360°, ſo is the Quantity of the *Synodical Month* to the *Periodical*.

Thus *Copernicus*, in the Year 1500, *November* 6, at 12 at Night, obſerv'd an Eclipſe of the Moon at *Rome*; and *Auguſt* 1, 1523, at 4 Ho. 25 Sec. another at *Cracow*; hence the Quantity of the *Synodical Month* is thus determin'd:

Obſ. 2. *An.* 1523.	d.	292h. 2.5′
Obſ. 1. *An.* 1500.	d.	310h. 2.20′
Interval of Time *An.*	22 d.	292h. 2.5′
Add the Intercalary Days		5
Exact Interval *An.*	22 d.	297h. 2.5′
Or		11991005′

Which divided by 282 Months, elaps'd in the mean Time, gives the Quantity of the *Synodical Month*, 42521′ 9″ 9‴; that is, 29 Days, 12 Hours, 41 Minutes.

From two other Obſervations of Eclipſes, the one at *Cracow*, the other at *Babylon*, the ſame Author determines more accurately the Quantity of the *Synodical Month* to be

42524′ 3″ 10‴ 9⁗

That is, 29d. 11h. 43′ 5″ 10‴.

The

	°	′	″	‴
The Sun's mean Motion in the Time	29	6	24	18
The Moon's Motion	389	6	24	18

Quantity of the *Periodical Month* 27d. 7h. 43′ 5″

Hence, 1. The Quantity of the *Periodical Month* being given; by the Rule of Three we may find the Moon's diurnal and horary Motion, &c.

2. If the Sun's mean diurnal Motion be ſubtracted from the Moon's mean diurnal Motion, the Remainder will give the Moon's diurnal Motion from the Sun.

3. Since in the Middle of a total Eclipſe the Moon is in the Node; if the Sun's Place be found for that Time, and to this be added ſix Signs, the Sum will give the *Place of the Node*.

4. From comparing the antient Obſervations with the modern, it appears, that the Nodes have a Motion, and that they proceed *in antecedentia*, *i.e.* from *Taurus* to *Aries*, from *Aries* to *Piſces*, &c. if then to the Moon's mean diurnal Motion be added the diurnal Motion of the Nodes, the ſame will be the Motion of the Latitude; and thence by the Rule of Three may be found in what Time the Moon goes 360° from the *Dragon's Head*, or in what Time ſhe goes from, and returns to it; that is, the Quantity of the *Draconitick Month*.

5. If the Motion of the diurnal *Apogee* be ſubtracted from the mean Motion of the Moon, the Remainder will be the Moon's mean Motion from the *Apogee*; and thence, by the Rule of Three, is determin'd the Quantity of the *Anomaliſtick Month*.

According to *Kepler*, the mean *Synodical Month* is 29 Days, 12 Hours, 44 Minutes, 3 Seconds, 2 Thirds. Her *Periodical Month*, 27 Days, 7 Hours, 43 Minutes, 5 Seconds. The Place of the *Apogee* for the Year 1700, *January* 1, *O. S.* was 11 S. 8° 57′.1. The Place of the Aſcending Node 4 S. 27° 39′ 17″. Mean diurnal Motion of the Moon 13° 10′ 35″. Diurnal Motion of the *Apogee*, 6′ 41″. Diurnal Motion of the Nodes, 3′ 11″. Laſtly, the Eccentricity 4362 Parts, ſuch, whereof the Semidiameter of the Eccentrick is 100000: And therefore the diurnal Motion of the Latitude is 13° 13′ 46″; and the diurnal Motion from the *Apogee* 13° 3′ 54″.

Note, That ECCENTRICITY is the Diſtance of the *Orbit* of a Planet from the Center of the Sun, *i. e.* the Diſtance between the Center of the *Ellipſis* and the *Focus* thereof; called alſo, *ſimple*, or *ſingle Eccentricity*.

Double Eccentricity, is the Diſtance between the two *Foci* in the *Ellipſis*, which is equal to twice the ſingle *Eccentricity*.

The Tables of Equation which ſerve to ſolve the Irregularities of the *Sun*, do likewiſe ſerve for thoſe of the *Moon*, with this Precaution, that theſe Equations muſt be corrected for the *Moon*, otherwiſe they will not exhibit the true Motion in the *Syzygies*; which Corrections are attended with prodigious Difficulties: for the Lunar Inequalities are ſo many, that no *Aſtronomer* could bring them under any Rule, before Sir *Iſaac Newton* was pleaſed to favour the learned World with the Mechanical Cauſes of theſe Inequalities, and with the Method of computing and aſcertaining them. He ſhews, from the Theory of Gravity, that the larger Planets revolving round the *Sun* may carry along with them ſmall Planets revolving round themſelves; and ſhews, *A priori*, that thoſe ſmaller muſt move in *Ellipſes*, having their *Umbilici* in the Centers of the larger; and have their Motion in their Orbits variouſly diſturbed by the Motion of the *Sun*; and, in a Word, muſt be affected with thoſe Inequalities which we actually obſerve in the *Moon*: And from this Theory he argues analogous Irregularities in the *Satellites* of *Saturn*.

From this ſame Theory he examines the Force which the *Sun* has to diſturb the *Moon*'s Motion, determine the horary Increaſe of the Area which the *Moon* would deſcribe in a circular *Orbit* by *Radii* drawn to the Earth. Her Diſtance from the Earth. The horary Motion in a circular and Elliptick *Orbit*. The mean Motion of the Nodes. The true Motion of the Nodes. The horary Variation of the Inclination of the *Moon*'s *Orbit* to the Plane of the Ecliptick. From the ſame Theory he has found the annual Equation of the *Moon*'s mean Motion to ariſe from the various Dilatation of her *Orbit*; and that Variation to ariſe from the *Sun*'s Force, which being greater in the *Perigee*, diſtends the *Orbit*; and being leſs in the *Apogee*, ſuffers it to be again contracted. In the dilated *Orbit* ſhe moves more ſlowly; in the contracted more ſwiftly: And the annual Equation, whereby this Inequality is compenſated, in the *Apogee* and *Perigee*, is nothing at all; at a moderate Diſtance from the *Sun* amounts to 11′, 50″; and in other Places is proportional to the Equation of the *Sun*'s Center, and is added to the mean Motion of the *Moon*, when the Earth proceeds from its *Aphelion* to its *Perihelion*; and ſubtracted when in the oppoſite Part. Thus, ſuppoſing the Radius of the great *Orbit* 1000, and the Earth's Excentricity 16$\frac{7}{8}$; this Equation when greateſt, according to the Theory of Gravity, comes out 11′, 49″.

He adds, that in the Earth's *Perihelion* the Nodes move ſwifter than in the *Aphelion*, and that in a triplicate Ratio of the Earth's Diſtance from the *Sun*, inverſely, and the greateſt Equation of the Center which this Inequality occaſions, is 1°, 56′, 26″, agreeable to the *Sun's* Excentricity 16$\frac{1}{6}$. If the *Sun*'s Motion were in a triplicate Ratio of its Diſtance inverſely, this Inequality could generate the greateſt Equation 2°, 56′, 9″; and therefore the greateſt Equations which the Inequalities of the Motions of the *Moon*'s *Apogee* and Nodes occaſion, are to 2°, 56′, 9″, as the mean diurnal Motion of the *Moon*'s *Apogee*, and the mean diurnal Motion of her Nodes, are to the mean diurnal Motion of the *Sun*. Whence the greateſt Equation of the mean Motion of the *Apogee* comes out 19′, 42″; and the greateſt Equation of the mean Motion of the Nodes 9′, 27″. The former Equation is added, and the latter ſubtracted, when the Earth proceeds from its *Perihelion* to its *Aphelion*; and the contrary in the oppoſite Part of its *Orbit*.

From the ſame Theory of Gravity it alſo appears that the *Sun*'s Action on the *Moon* muſt be ſomewhat greater when the tranſverſe Diameter of the Lunar *Orbit* paſſes through the *Sun*, than when it is at right Angles with the Line that joins the Earth and *Sun*: And, therefore that the Lunar *Orbit* is ſomewhat greater in the firſt Caſe than in the ſecond. Hence ariſes another Equation of the mean Lunar Motion, depending on the Situation of the *Moon*'s *Apogee* with Regard to the *Sun*, which is greateſt when the *Moon*'s *Apogee* is an Octant with the *Sun*; and none, when ſhe arrives at the Quadrature or *Syzygies*; and is added to the mean Motion in the Paſſage of the *Moon*'s *Apogee* from the Quadrature to the *Syzygies*, and ſubtracted in the Paſſage of the *Apogee* from the *Syzygies* to the Quadrature. This Equation, which Sir *Iſaac* calls *Semeſtris*, when greateſt, *viz.* in the Octants of the *Apogee*, ariſes to 3′, 45″, at a mean Diſtance of the Earth from the *Sun*; but it increaſes and diminiſhes in a triplicate Ratio of the *Sun*'s Diſtance inverſely; and therefore in the *Sun*'s greateſt Diſtance, is 3′, 34″; in the ſmalleſt 3′ 56″, nearly. But when the *Apogee* of the *Moon* is without the Octants, it becomes leſs, and is to the greateſt Equation, as the Sine of double Diſtance of the *Moon*'s *Apogee*, from the next *Syzygy* or Quadrature to the *Radius*.

From the ſame Theory of Gravity it follows, that the Sun's Action on the *Moon* is ſomewhat greater when a right Line drawn through the *Moon*'s Nodes paſſes through the Sun, than when that Line is at right Angles with another joining the Sun and Earth; and hence ariſes another Equation of the *Moon*'s mean Motion, which he calls *Secunda Semeſtris*, and which is greateſt when the Nodes are in the Sun's Octants, and

and vaniſhes when they are in the *Syzygies*, or *Quadratures*; and in other Situations of the Nodes, is proportionable to the Sine of double the Diſtance of either Node from the next *Syzygy*, or *Quadrature*.—It is added to the *Moon*'s mean Motion while the Nodes are in their Paſſage from the *Sun*'s *Quadratures* to the next *Syzygy*, and ſubſtracted in their Paſſage from the *Syzygies* to the *Quadratures* in the Octants.—When it is greateſt it amounts to 47″, at a mean Diſtance of the Earth from the *Sun*; as appears from the Theory of Gravity: At other Diſtances of the *Sun*, this Equation in the Octants of the Node is reciprocally as the Cube of the *Sun*'s Diſtance from the Earth; and therefore in the *Sun*'s *Perigee* is 45″, in his *Apogee* very near 49″.

By the ſame Theory of Gravity, the *Moon*'s *Apogee* proceeds the faſteſt when either in Conjunction with the *Sun*, or in Oppoſition to it; and is retrograde when in *Quadrature* with the *Sun*. In the former Caſe, the Eccentricity is greateſt, and in the latter, ſmalleſt. Theſe Inequalities are very conſiderable, and generate the principal Equation of the *Apogee*, which he calls *Semeſtris*, or *Semi-menſtrual*.—The greateſt *Semi-menſtrual* Equation is about 12°, 18′.

Horrox firſt obſerved the *Moon* to revolve in an *Ellipſis* round the Earth placed in the lower *Umbilicus*: and *Halley* placed the Center of the *Ellipſis* in an *Epicycle*, whoſe Center revolves uniformly round the Earth: And from the Motion in the *Epicycle* ariſe the Inequalities now obſerved in the Progreſs and Regreſs of the *Apogee*.

Note, That EQUATION is the Difference between mean and apparent Time; or the Reduction of the apparent unequal Time, or Motion of the *Sun*, or a *Planet*, to equable and mean Time or Motion.—Time is only meaſured by Motion; and as Time, in itſelf, flows ever equably; to meaſure it, ſuch a Motion muſt be uſed as is equable, or which always proceeds at the ſame Rate.

Before we proceed to the Demonſtration of the *Eclipſes* of the *Sun*, *Moon*, &c. we muſt obſerve the *Moon*'s *Parallax*; which is done by obſerving the *Moon*'s Meridian Altitude with the greateſt Accuracy; and marking the Moment of Time: This Time being equated, we muſt compute her true Latitude and Longitude, and from theſe find her Declination; and from her Declination and the Elevation of the *Equator* find her true Meridian Altitude. If the obſerved Altitude be not Meridian, we muſt reduce it to the true Altitude for the Time of Obſervation; and by taking the Refraction from the obſerved Altitude, and ſubtracting the Remainder from the true Altitude; the Remainder will be the *Moon*'s *Parallax*. By this Means, *Tycho*, in *October* 1583, 12 Days, 5 Hours, 19 Minutes, from the Moon's Meridian Altitude obſerv'd, 13 Degrees, 38 Minutes, found her *Parallax* 54 Minutes.

Note, That ALTITUDE, in *Aſtronomy*, is the Diſtance of a Star, or other Point in the Mundane Sphere, from the Horizon. This *Altitude* may be either true or apparent. If it be taken from the rational or real Horizon, the Altitude is ſaid to be true and real; if from the apparent or ſenſible Horizon, the Altitude is apparent. Or rather the apparent Altitude is ſuch as it appears to our Obſervation; and the true, that from which the Refraction has been ſubtracted. The Meridian being a vertical Circle, a *Meridian Altitude*, that is, the Altitude of a Point in the Meridian, is an Arch of the Meridian intercepted between it and the Horizon. The *Longitude* of the *Moon* is her Place in the *Zodiack*.

De la Hire makes the greateſt horizontal *Parallax* 1°, 1′, 25″, the ſmalleſt 54′, 5″. Therefore the *Moon*'s Diſtance from the Earth, when in her *Perigee*, is $55\frac{07}{100}$, that is almoſt 56 Semi-Diameters; in her *Apogee* $63\frac{57}{100}$, that is, $63\frac{1}{2}$ Semidiameters of the Earth.

Note, That a SEMIDIAMETER is a right Line drawn from the Center of a Circle or Sphere to its Circumference, the ſame with what we otherwiſe call *Radius*.

Note alſo, That the Diſtances of the Planets from the Sun and Earth, in Semidiameters of the Earth, ſuppoſing the greateſt horizontal *Parallax* 6″; and the Dimenſions of the *Orbits* as aſſigned by *Kepler*, are as follow:

Diſtance from the *Sun*	greateſt	mean	leaſt	Diſtance from the *Earth*	greateſt	mean	leaſt
Saturn,	326925	308290	187254	*Saturn*,	380556	327544	274532
Jupiter,	178640	170026	34560	*Jupiter*,	222250	179259	136268
Mars,	57226	52326	47426	*Mars*,	92221	52944	13668
Earth,	37995	34377	33758	*Earth*,	34996	34377	33759
Venus,	25061	24889	24718	*Venus*,	60056	34548	9041
Mercury,	16142	13340	10537	*Mercury*,	51138	37179	23221
				Luna,			

Caſſini makes the Diſtances ſomewhat leſs; as ſuppoſing the *Sun*'s *Parallax* a little greater.

Diſtance from the *Earth*	greateſt	mean	leaſt	Diſtance from the *Earth*	greateſt	mean	leaſt
Saturn,	244000	210000	176000	*Venus*,	38000	22000	6000
Jupiter,	155000	143000	87000	*Mercury*,	33000	22000	11000
Mars,	59000	33500	8000	*Moon*,			
Sun,	22374	22000	21626		57	53	6

Note, further, that the *Diſtance of the Sun from the Moon*'s *Node*, or *Apogee*, is an Arch of the *Ecliptick*, intercepted between the *Sun*'s true Place, and the *Moon*'s Node or *Apogee*. That by the *Sun*'s Place is underſtood the Sign and Degree of *Zodiack*, which the Luminary is in: Or is that Degree of the *Ecliptick*, reckoning from the Beginning of *Aries*, which the *Sun*'s Circle of Longitude cuts: And therefore coincides with the Longitude of the *Sun*. As the Sine of the *Sun*'s greateſt Declination, 23° 30′ to the Sine of any preſent Declination given or obſerved, *v. gr.* 23° 15′: So is *Radius* 10 to the Sine of his Longitude 81° 52′; which if the Declination were North, would give 20° 52′ of *Gemini*, if South 20° 52′ of *Capricorn*, for the *Sun*'s Place. The *Moon*'s Place is that Point of her *Orbit* wherein ſhe is found at any Time.

Perſons,

Perſons, utter Strangers to *Aſtronomy*, will certainly expect that I'll inſtruct them how to find the *Moon*'s Age, the Time of her being in the Meridian, and the Time of her beginning to ſhine. Therefore:

To find the *Moon*'s Age, we muſt add to the Day of the Month the Epact of the Year, and the Months from *March* inclusive. The Sum, if under 30; if over, the Exceſs is the *Moon*'s Age. If the Month has but 30 Days, the Exceſs above 29 is the *Moon*'s Age.

To find the Time of the *Moon* being in the Meridian, we muſt multiply her Age, if under 15 Days by 4; and divide the Product by 5; the Quotient gives the Hour, and the Remainder multiplied by 12 the Minute. If her Age exceeds 15, we muſt ſubtract 15, and proceed with the Remainder as before. To find the Time of the *Moon*'s Beginning to ſhine, we muſt mutiply her Age, if under 15 by 48, and divide the Product by 60: The Quotient gives the Hour; and the Remainder the Minute. If her Age be above 15 Days, we muſt ſubtract the Time thus found from 24; the Remainder gives the Time of ſhining in the Morning.

At preſent we'll proceed to *Eclipſes* of the *Sun* and *Moon*.

ECLIPSE, from the *Greek* εκλειψις, from εκλειπω, I fail, in *Aſtronomy*, is a Privation of the Light in one of the Luminaries, by the Interpoſition of ſome opake Body, either between it and the Eye; or between it and the *Sun*.

When the *Moon* paſſes between the Earth and the *Sun*, and deprives us of his Aſpect, that's called an *Eclipſe* of the *Sun*, which is always the greater, the greater is the Part, it ſteals from our Sight, which may alſo ſometimes be total, if the Eclipſe covers it entirely.

Eclipſe of the *Sun*, *fig.* 4. is diſtinguiſhed into *Total* and *Partial*.

As the *Moon* is found to have a *Parallax* of Latitude; *Eclipſes* of the *Sun* only happen when the Latitude of the *Moon*, viewed from the *Sun*, is leſs than the Aggregate of the apparent Semidiameter of the *Sun* and *Moon*. Therefore ſolar *Eclipſes* happen when the *Moon* is in Conjunction with the *Sun*, in or near the Nodes, *i. e.* at the new *Moons*. Conſequently the memorable *Eclipſe* of the *Sun*, at our Saviour's Paſſion, happening at the Time of full *Moon*, when the *Sun* and *Moon* are in Oppoſition, was preternatural.

If there is not an *Eclipſe* of the *Sun* every new *Moon*, though the new *Moon* covers the *Sun* from the Earth, 'tis becauſe the *Moon*'s Way is not preciſely under the *Ecliptick*, but placed obliquely thereto; only interſecting it twice in every Period; ſo that *Eclipſes* can only be occaſioned in ſuch new *Moons*, as happen in theſe Interſections or Nodes, or very near them. In the Nodes, when the *Moon* has no viſible Latitude, the *Occultation* is total, *fig.* 5; and with ſome Continuance, when the *Diſk* of the *Moon* in *Perigæo*, appears greater than that of the *Sun* in *Apogæo*, and its Shadow is extended beyond the Surface of the Earth; and, without Continuance, or moderate Diſtances, when the Cuſp or Point of the *Moon*'s Shadow barely touches the Earth. Out of the Nodes, but near them, the *Eclipſes* are partial.

The other Circumſtances of ſolar *Eclipſes* are, 1. That none of them are univerſal; that is, none of them are ſeen throughout the whole Hemiſphere, which the *Sun* is then above; the *Moon*'s Diſk being much too little, and much too near the Earth to hide the *Sun* from the Diſk of the Earth, which is fifteen Times bigger than it. 2. Nor does the *Eclipſe* appear the ſame in all Parts of the Earth, where it is ſeen; but when in one Place it is total, in another it is partial. Farther, when the *Moon* being in her *Apogee*, appears much leſs than the *Sun*, as happens moſt ſenſibly, when he is in *Perigæo*; the Cuſp of the Lunar Shadow not reaching the Earth, ſhe becomes in a central Conjunction with the *Sun*, yet not able to cover his Diſk; but lets his whole Limb appear like a lucid Ring or Bracelet, hence called an *annular Eclipſe*. 3. It does not happen at the ſame Time in all Places where it is ſeen; but appears more early to the Weſtern Parts, and later to the Eaſtern. 4. Its Beginning is always on the Weſtern Side the *Sun*, and on the ſame Side it ends. 5. In total *Eclipſes* of the *Sun* the *Moon*'s darkened *Diſk* is ſeen covered with a faint dawning Light; which is commonly attributed to the Reflection of the Light from the illuminated Part of the Earth. *Laſtly*, in *total Eclipſes* of the *Sun*, the *Moon*'s Limb is ſeen ſurrounded by a pale Circle of Light; which the late *Aſtronomers* take for a manifeſt Indication of a Lunar Atmoſphere.

Note, That DISK, in *Aſtronomy*, is the Body or Face of the *Sun* or *Moon*, ſuch as it appears to us. The *Diſk* is conceived to be divided into twelve equal Parts, called *Digits*; by means whereof it is, that the Magnitude of an *Eclipſe* is meaſured, or eſtimated. Such an *Eclipſe* was ſo many Digits or Parts of the *Sun*, or *Moon*'s Diſk. *Mercury* and *Venus* are ſometimes ſeen in the *Sun*'s *Diſk*, tranſiting the *Sun*'s *Diſk*. In a *total Eclipſe* of either of thoſe Luminaries, the whole *Diſk* is obſcured or darkened; in a partial *Eclipſe* only Part of them.

Note further, That the LIMB ſignifies the outermoſt Border, or Edge of the *Sun* or *Moon*, when the Middle or *Diſk* is hid in an *Eclipſe* of either Luminary. *Aſtronomers* obſerve the lower and the upper *Limb* of the *Sun*, in Order to find its true Heighth, which is that of its Center.

To determine the Bounds of a ſolar *Eclipſe*, we muſt 1. Add together the apparent Semidiameters of the Luminaries both in *Apogæo* and *Perigæo*. 2. To the former Sum the greateſt *Parallax* of Latitude poſſible, ſince the *Parallax* diminiſhes the Northern Latitude; and ſince it augments the Southern Latitude from the ſame Sum we muſt ſubtract the greateſt *Parallax* of Latitude. Thus in each Caſe we'll have the true Latitude, beyond which there can be no *Eclipſe*. This Latitude given, the *Moon*'s Diſtance from the Nodes, beyond which *Eclipſes* cannot happen, is found.

Ptolemy makes the utmoſt Bound of *Eclipſes* at 12° 25′ Diſtance from the Node. *Copernicus* at 19° 12′. *Tycho* at 18° 25′. *Kepler* at 17° 16′. *Riccioli* at 18° 49′.

To find the Digits eclipſed, we muſt add the apparent Semidiameters of the Luminaries into one Sum, and ſubtract the *Moon*'s apparent Latitude from it, the Remainder is the Scruples or Parts of the Diameter eclipſed. Then ſay, as the Semidiameter of the *Sun* is to the Scruples eclipſed; ſo are 6 Digits reduced into Scruples, or 360 Scruples to the Digits eclipſed.

The Duration of a Solar *Eclipſe* is determined by finding the horary Motion of the *Moon* from the *Sun*, for one Hour before the Conjunction, and another Hour after; then we muſt ſay, as the former horary Motion is to the Seconds in an Hour, ſo are the Scruples of half Duration to the Time of Immerſion; and as the latter horary Motion is to the ſame Seconds, ſo are the ſame Scruples of half Duration to the Time of Immerſion. And adding the Time of Immerſion to that of Emerſion; the Aggregate is the total Duration.

By finding the Diſtance of the greateſt Obſcurity from the Moon's Latitude for the Time of Conjunction, the Beginning, Middle, and End of a *Solar Eclipſe* is determin'd. Then we ſay, As the horary Motion of the Moon from the Sun before the Conjunction, is to 3600 Seconds of an Hour; ſo is the Diſtance of the greateſt Darkneſs, to the Interval of Time between the greateſt Darkneſs and the Conjunction. We then ſubtract this Interval, in the firſt and third Quarters of the Anomaly, from the Time of the Conjunction; and in the other Quarters we muſt add it to the ſame; the Reſult is the Time of the greateſt Darkneſs. Laſtly, From the Time of the greateſt Darkneſs, we ſubtract the Time of Incidence, and add it

it to the Time of Emerſion; the Difference, in the firſt Caſe, will be the Beginning; and the Sum, in the latter Caſe, the End of the *Eclipſe*. Though the Interval between the Conjunction and the greateſt Obſcurity is ſo very ſmall, and ſo exceedingly precarious, that it is ſcarce worth while to be ſo very preciſe; and, accordingly, many Authors uſe the Time of the apparent Conjunction for that of the greateſt Darkneſs. Or if you would determine it with more Accuracy, ſubtract about two Minutes for the Diſtance between the Conjunction ſeen, and the Time of the greateſt Obſcurity.

To calculate an *Eclipſe of the Sun*, we muſt find, 1. The mean New Moon, and thence the true one, together with the Place of the Luminaries for the apparent Time of the true one. 2. Compute the apparent Time of the New Moon obſerv'd for the apparent Time of the true New Moon. 3. Compute the Latitude ſeen, for the apparent Time of the New Moon ſeen. 4. Thence determine the Digits eclips'd. 5. We muſt find the Times of the greateſt Darkneſs, Immerſion, and Emerſion; and thence determine the Beginning and Ending of the *Eclipſe*.

Flamſteed has invented a Method of repreſenting the *Solar Eclipſes*, which, by a geometrical Conſtruction, removes all the Difficulties and Impediments of the *Calculus*; which is this:

There muſt be underſtood innumerable Lines conducted from the Circles of the Earth, (through a Plane which ſhould touch the *Lunar Orbit*; which Plane muſt be level to the right Line which connects the Centers of the Sun and of the Earth) to the Center of the Sun. All thoſe Lines ſhall cut the ſaid Plane, and will ſhew the Terreſtrial Sphere, projected with its Circles on that Plane: So that the Eye plac'd in the Sun's Center, muſt ſee the Earth, and its annual, as well as diurnal Motion, accompliſh'd in the ſame Plane, in the ſame Manner we ſee from the Earth, the Moon and the Sun, with all their Mutations, as if they were but plain Superficies, and had their ſpherical Circles deſcrib'd in plain *Diſks*: Then from the Projection of ſuch ſpherical Terreſtrial Superficy, will ariſe in this Plane, a Circle of Baſis, call'd the *Diſk of the Earth*; and which is to be every where equal to the Plane of the *Ecliptick*: Then will ariſe, likewiſe, a right Line extended on each Side through its Center, which will repreſent the Axis of the Earth, projected in that Plane, inclin'd on each Angle to the Plane of the *Ecliptick*, according to the Difference of the Seaſons. And the *Parallelifm* of the Terreſtrial Axis, on Reaſon of its different Situation to our Plane, will make the Inequality of the Angle in the ſame Plane. There will ariſe, likewiſe, in the ſame Plane, by the diurnal Motion of each Point in the Superficy of the Earth, innumerable *Ellipſes*, by whoſe different Situations the Place in the Plane given will be determin'd, and ſeparated from them all.

Therefore, if in the *Solar Eclipſes* we can diſcover in that Plane, the Lines, and the Ways which the Moon will paſs through, we'll diſcover, alſo, the Place of our Hemiſphere which is to be at that Time darken'd, by its Interpoſition; which can be done in the following Manner:

Having found the leſſer Diſtance of the Center of the Earth, or of the *Diſk* and *Penumbra* of the Center, and likewiſe the Diſtance of its ſmaller Line in our Plane, from the Area of the *Ecliptick*, let be drawn from the Point of the leſſer Diſtance in the Plane, a Line perpendicular to it; this Line will trace the Paſſes or Way of the *Penumbra*, in the Baſe, or *Diſk* of the Circle. Then we muſt mark in that right Line the Hours, with their Quarters and Minutes, of our Meridian, which anſwer to the *Phænomena* of the *Eclipſe*; marking, likewiſe, in the Ecliptick Line of our Plane, the Hours, with their Parts, ſo that each Hour, and each ſmaller Part of the Hour, mark the Point where your Place, deſcrib'd in the *Ellipſe*, is fix'd: In this Manner, and by thoſe Moments of Time given, in our Right, and Elliptical Line, we'll diſcover the *Phænomena* of the *Eclipſe* which are to appear in our Place. Take from a Scale of equal Parts, eſpecially that from whence you have taken your whole Delineation, the Semidiameter of the *Penumbra*, and having carried one Shank of your Compaſs through the Paths of the *Penumbra*, and direct the other towards the Path of your Place, if it cannot reach it, there will be no Occultation of the Sun in your Place; but if, on the contrary, you perceive that it not only reaches it, but even goes beyond it, then there will be an *Eclipſe*; *total*, if there be an Interſection between the Trace of the *Penumbra*, and that of your Place; and only *partial*, if there be no ſuch Interſection. Likewiſe, you'll have the Middle of the *Eclipſe* at that very Time, when having applied the Shanks of the Compaſſes to the Axis of the parallel *Ecliptick*, you'll obſerve the ſame Hour in both Traces, or Paths. Laſtly, you'll find the End of the *Eclipſe*, when it will be proper to mark the ſame Hour, in the Path of the Center of the *Penumbra*, and in the Path of your Place; whence the Beginning, Middle, and End of an *Eclipſe* may be accompliſh'd by a Projection of Lines, without the Aſſiſtance of a *Calculus*, or *Parallaxes*.

Note, That IMMERSION, or *Incidence* of an *Eclipſe*, we have ſo often mention'd in this Place, is the Moment when Part of the Sun or Moon's *Diſk* firſt begins to be hid. And *Emerſion*, or *Expurgation* of an *Eclipſe*, is the Time when the eclipſed Luminary begins to re-appear, or emerge out of the Shadow.

ECLIPSE *of the Moon*, *fig.* 6. is a Deficiency of Light in that Planet, occaſioned by a diametrical Oppoſition of the Earth, between the *Sun* and *Moon*.

When all the Light of the *Moon* is intercepted, or when her whole *Diſk* is covered, the *Eclipſe* is ſaid to be *total*; when only part, *partial*. When the *total Eclipſe* laſts for ſome Time, it is ſaid to be *totalis cum morâ*, total with Continuance; when only inſtantaneous, *totalis ſine morâ*, total without Continuance. *Eclipſes of the Moon* only happen in the Time of Full Moon; becauſe it is only then the Earth is between the *Sun* and *Moon*. Nor do they happen every Full Moon, by reaſon of the Obliquity of the Moon's Way with Reſpect to the Sun's; but only in thoſe Full Moons which happen either in the Nodes, or very near them, where the Aggregate of the apparent Semidiameters of the Moon, and the Earth's Shadow, is greater than the Latitude of the Moon, or the Diſtance between their Centers.

The moſt conſiderable Circumſtances in the *Eclipſes* of the *Moon*, are, 1. That as the Sum of the Semidiameters of the Moon, and Earth's Shadow, is greater than the Aggregate of the Semidiameters of the Sun and Moon, it is evident *Lunar Eclipſes* may happen in a greater Latitude of the Moon, and at a greater Diſtance from the Nodes; and conſequently are more often obſerved in any one Part of the Earth, than Solar ones; though with Reſpect to the whole Earth the latter are as frequent as the former. 2. *Total Eclipſes*, and thoſe of the longeſt Duration, happen in the very Nodes of the *Ecliptick*; by reaſon the Section of the Earth's Shadow, then falling on the Moon, is conſiderably greater than her *Diſk*. There may likewiſe be *total Eclipſes* within a little Diſtance of the Nodes; but the further, the leſs their Duration; further off ſtill, there are only partial ones, and at length none at all: As the Latitude and the Semidiameter of the Moon, together, are either leſs, equal, or greater than the Semidiameter of the Shadow. 3. All *Lunar Eclipſes* are univerſal, *i. e.* are viſible in all Parts of the Globe which have the Moon above their Horizon; and are every where of the ſame Magnitude, and begin and end together. 4. In all *Lunar Eclipſes* the eaſtern Side is what firſt immerges, and alſo emerges; ſo that though at firſt the *Moon* be more weſterly than the Earth's Shadow, yet her proper Motion being ſwifter than the ſame, ſhe overtakes

takes, and out-goes it. 5. The *Moon*, even in the Middle of an *Eclipse*, has usually a faint Appearance of Light; which *Gassendus*, *Ricciolus*, *Kepler*, &c. attribute to the Light of the Earth's Atmosphere transmitted thither. Lastly, She grows sensibly paler, and dimmer, before ever she enters within the Earth's Shadow, which is attributed to the Earth's *Penumbra*.

Note, That PENUMBRA, is a faint, or partial Shade, observ'd between the perfect Shadow, and the full Light of an *Eclipse*. The *Penumbra* arises from the Magnitude of the *Sun*'s Body; were he only a luminous Point, the Shadow would be all perfect; but by reason of the Diameter of the *Sun*, it happens, that a Place which is not illuminated by the whole Body of the *Sun*, does yet receive Rays from a Part thereof. A *Penumbra* must be found in all *Eclipses*, whether of the *Sun*, *Moon*, or the other Planets, primary or secondary; but it is most considerable with us in *Eclipses* of the *Sun*. In *Eclipses* of the *Moon* the Earth is encompass'd, indeed, with a *Penumbra*, but it is only sensible to us on the Earth near the total Shadow. The *Penumbra* extends infinitely in Length, inasmuch as to each Point of the Diameter of the *Sun* there answers a Point infinite in Length, into which no Rays enter from that Point, though they do from others. M. *De la Hire* examines the different Degrees of the *Penumbra*, and represents them geometrically, by the Ordinates of a Curve, which shall be among themselves, as the several Parts of the *Sun*'s *Disk*, wherewith a Body planted in the *Penumbra* is enlighten'd.

Before we can expect to be Masters of a sure Method of calculating the Times, Places, Magnitudes, and other *Phænomena* of the *Eclipses* of the *Moon*, we must endeavour to find, 1. The Length of the Earth's shadowy Cone. 2. The apparent Semidiameter of the Earth's Shadow, in the Place of the *Moon*'s Passage, for any given Time. And, 3. The Arch between the Centers, (*fig.* 12.) and the Arch C. after the *Moon*'s Latitude at the Time of her Opposition, together with the Angle at the Node B. has been given.

The Length of the Earth's shadowy Cone is found, by finding the *Sun*'s Distance from the Earth for the given Time. Suppose, for Example, the *Sun*'s greatest Distance from the Earth 34996 Semidiameters of the Earth; and the *Sun*'s Semidiameter to be to that of the Earth, as 153 to 1; then will the Length of the shadowy Cone be found 230½. Hence, as the *Moon*'s least Distance from the Earth is scarce 64 Semidiameters, the *Moon*, when in Opposition to the *Sun*, in or near the Nodes, will fall into the Earth's Shadow, though the *Sun* and *Moon* be in their *Apogees*; and much more, if they be in or near their *Perigees*, by reason the Shadow is then longer, and the *Moon* nearer the Base of the Cone.

By finding the *Sun* and *Moon*'s Distance from the Earth, and thence their *horizontal Parallaxes*, is found the apparent Semidiameter of the Earth's Shadow, in the Place of the *Moon*'s Passage for any Time given; if the *Parallaxes* be added together, and the apparent Semidiameter of the *Sun* be subtracted from the Sum, then the Remainder is the apparent Semidiameter of the Shadow. Thus suppose the *Moon*'s *horizontal Parallax* 56′ 48″, the *Sun*'s 6″; the Sum is 56′ 54″: From which the *Sun*'s apparent Semidiameter, 16′ 5″, being subtracted, leaves 40′ 49″ for the Semidiameter of the Shadow. M. *De la Hire* omits the *Sun*'s *Parallax* as of no Consideration; but increases the apparent Semidiameter of the Shadow by a whole Minute, for the Shadow of the Atmosphere; which would give the Semidiameter of the Shadow, in our Instance, 41′ 13″.

Since in the spherical Triangle A I L, (*fig.* 35.) rectangular at I, the Side A L is given, as also the Angle A L I, as being the Complement of L A I, or B, to a right Angle; the Arch between the Centers, A I, is found by spherical Trigonometry: And since the Angle L A I is equal to B, each of them, with A B, making a right Angle; and the *Moon*'s Latitude A C is given; the Arch L I will likewise be found by spherical Trigonometry.

We determine the Bounds of an *Eclipse of the Moon*, by adding the apparent Semidiameters of the *Moon*, in *Perigæo*, and of the Shadow, supposing the *Sun* in *Apogæo*; by which we shall have the Side M O (*fig.* 36.) Then in the spherical Triangle M N O, having given, the Angle at the Node, whose Quantity is the *Moon*'s greatest Latitude in the Conjunction, the right Angle E, and the Leg M O, we must find the *Moon*'s Distance from the Node N O, which is the utmost Bound, beyond which the *Eclipse* cannot reach. Adding, after the same Manner, the apparent Semidiameters of the *Moon* in *Apogæo*, and of the Shadow of the *Sun* in *Perigæo*, for the Sake of having the Arch L K, in the Triangle N L h, the Distance of the *Moon* in the Ascending Node will be found by spherical Trigonometry; which is the Bound within which the *Moon* will necessarily be *eclipsed*. For Example; The Semidiameter of the Shadow, when the *Sun* is in *Apogæo*, and the *Moon* in *Perigæo*, according to *Kepler*, is 49′ 40″, and the apparent Semidiameter of the *Moon* in *Perigæo* 16′ 22″; consequently, M O is 66′, or 1° 6′; and therefore there will be no *Eclipse* at all, if the *Moon*'s Latitude be greater than 1° 6′. Now as the same Angle N, is suppos'd by *Kepler* to be 5° 18′;

Log. of Sine N	89655337
Sine M O	82832433
Whole Sine	100000000
Log. of Sine O N	93177096

The Remainder corresponding to which, in the Tables, is 11° 59′ 50″. If, therefore, the *Moon*'s Distance from the Ascending Node be greater than 12°, no *Eclipse* can happen. And, in like Manner, the Semidiameter of the Shadow in the *Sun*'s *Perigee*, and the *Moon*'s *Apogee*, is 43′ 50″, and the *Moon*'s Semidiameter in her *Apogee* 15′: Consequently L h is 58′ 50″; and therefore there will be an *Eclipse*, if the *Moon*'s Latitude do not exceed 58′ 50″: But here, as before, the Argument of the Latitude is found 1° 40′.

Note, That SINE, is a right Line drawn from one Extremity of an Arch, perpendicularly upon the Radius, drawn from the other Extremity. Or the *Sine* is Half the Chord of twice the Arch. That *Arch*, is a Part of any curve Line, for Example, of a *Circle*, *Ellipsis*, or the like. And that *Chord*, is the Base, or Line that joins the two Extremes of the *Arch*.

If we will determine the *Quantity of an Eclipse*, or *the Number of the Digits eclipsed*, we must add the *Moon*'s Semidiameter to the Semidiameter of the Shadow, and subtract, from the Sum, the Arch between the Centers; the Remainder gives the Scruples, or Parts of the Diameter, *eclipsed*. Arguing thus; As the Measure of the Semidiameter of the *Moon*, signified by the Parts of the Degrees, is to the same Semidiameter, signified by the *Digits*; so is the Difference answering to the Quantity of Darkness, or the deficient Parts, mark'd by the Parts of the Degrees, to the same Parts, to be indicated by *Digits*. Whence, having applied every where the Rule of Proportion, the *ecliptical Digits*, with their Parts, may easily be found.

When we design to discover the Angle of Incidence, we must proceed thus: As the Sum of the apparent Semidiameters of the Shadow, and of the *Moon*, is to the Radius; so is, every where, the less Distance of the Centers, to the Sine Complement of

the Angle of Incidence; therefore the three firſt Terms being given, we'll diſcover the fourth by the Rule of Three, which will give not only the Angle of Incidence enquir'd for, but likewiſe that of *Exitus*. But as in the *total Eclipſe*, not only the Angles of Incidence, and of *Exitus*, are to be conſider'd, but alſo thoſe of a total Immerſion, and Emerſion; to find it, we muſt ſpeak thus:

As the Difference of the apparent Semidiameter of the Shadow, and *Moon*, is to the Radius; ſo is the leſs Diſtance of the Centers, to the Cone of the Angle of Immerſion: Therefore the three firſt Parts of the Analogy being given, the firſt muſt be known, which anſwers our *Quære*; and thereby we'll have diſcover'd both, the Angles of Incidence, and of Immerſion.

At preſent we muſt endeavour to find (through Means of this Calculus) the Duration of an *Eclipſe*.

To find *the Time of half Duration of an Eclipſe*, or the Arch of the *Lunar Orbit* which her Center deſcribes from the Beginning of the *Eclipſe* to the Middle thereof; we muſt add the Semidiameters of the Shadow A P, and the *Moon* P M, together; the Sum gives A N. From the Square of A N, we muſt ſubſtract the Square of A I, the Remainder is the Square of I N; and the Square Root of this Reſidue is the Arch I N, requir'd. But we will, perhaps, have the Scruples of half Duration of *total Darkneſs*, in a *total Eclipſe*. Then we'll ſubſtract the Moon's Semidiameter S V, from the Semidiameter of the Shadow A V; the Remainder is A S. In the Triangle A I S, which is rectangular at I; therefore we have the Arch A S, given by the laſt Method; and the Arch between the Centers A I; where the Arch I S is found, as in the laſt Problem.

We'll proceed ſtill further, and find, if we can, the Beginning, Middle, and End of a *Lunar Eclipſe*. Which to perform, we'll ſay, As the Moon's horary Motion from the Sun, is to 3600 horary Seconds; ſo are the Seconds of the Arch L I, (*fig.* 35.) to the horary Seconds equivalent thereto: Then ſubſtracting theſe Scruples, or Seconds, in the firſt and third Quadrant of the Anomaly, from the Time of Full Moon; and adding it to the ſame in the ſecond and fourth, the Reſult is the Time of the *Middle of the Eclipſe*. Then we'll ſay again, As the Moon's horary Motion from the Sun, is to 3600 Scruples, or Seconds; ſo are the Seconds of half Duration I N, to the Time of half Duration; the double of which gives the whole Duration. Laſtly, We'll ſubſtract the Time of half Duration from the Time of the *Middle of the Eclipſe*, the Remainder will be the *Beginning of the Eclipſe*. And if we add the ſame to the ſame, the Sum will be its End.

I cannot better conclude this Article, than by inſtructing my Pupils how to calculate an *Eclipſe of the Moon*, which muſt be done in the following Manner:

1. To find whether there will be an *Eclipſe*, or not. For the given Time of the mean Full Moon, we muſt compute the Moon's Diſtance from the Node. 2. The Time of the true Full Moon muſt be computed, with the Sun and Moon's true Place reduc'd to the *Ecliptick*. 3. For the Time of the true Full Moon, we are to compute the Moon's true Latitude, the Diſtance of each Luminary from the Earth, with the *horizontal Parallaxes*, and apparent Semidiameters. 4. For the ſame Time we muſt find the Sun and Moon's true horary Motion. 5. The apparent Semidiameter of the Shadow. And, 6. The Arch between the Centers A I, with the Arch L I. 7. Compute the Scruples of half Duration. And thence, 8. Determine the Beginning, Middle, and End of the *Eclipſe*. Laſtly, Find the Scruples *eclipſed*, and thence the Quantity of the *Eclipſe*.

The Antients had frightful Ideas of *Eclipſes*, as Preſages of the moſt diſmal Events. *Plutarch* aſſures us, that at *Rome*, it was not allow'd to talk publickly of any natural Cauſes of *Eclipſes*. They made a great Noiſe with brazen Inſtruments, and rais'd loud Shouts, during *Eclipſes* of the Moon, as thinking thereby to eaſe her in her Labour: Whence *Juvenal*, ſpeaking of a talkative Woman, ſays; *Una laboranti poterit ſuccurrere Lunæ*. Others have attributed the *Eclipſe* of the Moon to the Art of Magicians, who, by their Inchantments, pluck'd her out of Heaven, and made her ſkim over the Graſs. The Natives of *Mexico* keep Faſt, during *Eclipſes*, and, particularly, their Women, who beat and abuſe themſelves, drawing Blood from their Arms, *&c.* They imagine the Moon has been wounded by the Sun, in ſome Quarrel between them.

Having thus finiſh'd the Theory of the *Eclipſes* of the *Sun* and *Moon*, I ſhould proceed to the other Planets, if I was not determin'd to leave nothing untouch'd, in each Treatiſe, which can inſtruct, or flatter the Curioſity of the Reader; therefore I judge it proper to inform him, in this Place, of the Number of the *Stars* contain'd in each of the 48 *Conſtellations*; which I have heretofore often mention'd; beginning with thoſe of the *Zodiac*, and of thoſe, with *Aries*, which is, as I have already obſerv'd, the firſt of the 12 Signs of the *Zodiac*.

The *Stars* in the *Conſtellation* of *Aries*, in *Ptolemy's Catalogue*, are 18; in *Tycho*'s, 21; in the *Britannic Catalogue*, 65. In *Taurus*, the ſecond in Order, in *Ptolemy's Catalogue*, 44; in *Tycho*'s, 41; in the *Britannic Catalogue*, 135. In *Gemini*, the third, in *Ptolemy's Catalogue*, 24; in *Tycho*'s, 29; in the *Britannic Catalogue*, 89. In *Cancer*, the fourth, in *Ptolemy's Catalogue*, 13; in *Tycho*'s, 15; in *Bayer* and *Hevelius*'s, 29; in Mr. *Flamſteed*'s, 71. In *Leo*, the fifth, in *Ptolemy's Catalogue*, 32; in *Tycho*'s, 37; in the *Britannic Catalogue*, 97. In *Virgo*, the ſixth, into which the Sun enters in the Beginning of *Auguſt*, in *Ptolemy's Catalogue*, 32; in *Tycho*'s, 39; in the *Britannic Catalogue*, 89. In *Libra*, the ſeventh Sign, ſo call'd, becauſe when the Sun is in it, at the *Autumnal Equinox*, the Days and Nights are equal, as if weigh'd in a Ballance, there are 45 *Stars*. In *Scorpio*, the eighth, in *Ptolemy's Catalogue*, 20; in *Tycho*'s, 10; in *Flamſteed*'s, 49. In *Sagittarius*, the ninth, in *Ptolemy's Catalogue*, 31; in *Tycho*'s, 16; in the *Britannic Catalogue*, 50. In *Capricorn*, the tenth, in *Ptolemy* and *Tycho*'s *Catalogues*, 28; in that of *Hevelius*, 29; in the *Britannic Catalogue*, 51. In *Aquarius*, the eleventh, in *Ptolemy's Catalogue*, 45; in *Tycho*'s, 40; in the *Britannic Catalogue*, 99. In *Piſces*, the twelfth Sign, in *Ptolemy's Catalogue*, 38; in *Tycho*'s, 33; in the *Britannic Catalogue*, 109.

Of the other 36, 21 are plac'd on the North of the *Zodiac*, and 15 on the South.

The firſt of thoſe on the North, is *Urſa major*, a *Conſtellation* plac'd near the Pole, which conſiſts, according to *Ptolemy's Catalogue*, of 35 *Stars*; according to *Tycho*'s, of 56; and according to the *Britannic Catalogue*, of 215. *Urſa minor*, plac'd alſo in the Neighbourhood of the North Pole, of 8, according to *Ptolemy* and *Tycho*; and of 14, according to *Flamſteed*. In *Draco*, the ſecond northern *Conſtellation*, there are, according to *Ptolemy*, 31; according to *Tycho*, 32; according to *Bayer*, 33; and according to *Flamſteed*, 49. In *Cepheus*, the third, there are, in *Ptolemy's Catalogue*, 13; in *Tycho*'s, 11; in *Hevelius*'s, 40; in the *Britannic Catalogue*, 35. In *Bootes*, the fourth, in *Ptolemy's Catalogue*, 23; in *Tycho*'s, 28; in *Bayer*'s, 34; in *Hevelius*'s, 52; in *Flamſteed*, 55. In *Corona Borealis*, the fifth, in *Ptolemy's Catalogue*, 8; in *Tycho*'s, 8; in the *Britannic Catalogue*, 21. In *Hercules*, the ſixth, in *Ptolemy's Catalogue*, 29; in *Tycho*'s, 28; in the *Britannic Catalogue*, 95. In *Lyra*, the ſeventh, in *Ptolemy* and *Tycho*'s *Catalogues*, 10; in the *Britannic Catalogue*, 19. In *Cygnus*, the eighth, in *Ptolemy's Catalogue*, 17; in *Tycho*'s, 19; in the *Britannic Catalogue*, 107. In *Caſſiopeia*, the ninth, in *Ptolemy's Catalogue*, 13; in *Tycho*'s, 28; in *Flamſteed*'s, 56.

Note, That in 1572, there appear'd a new *Star* in this *Conſtellation*, which at firſt ſurpaſs'd, in Magnitude, and Brightneſs, *Jupiter* himſelf;

but it diminiſh'd by Degrees, and at the End of 18 Months totally diſappear'd. It allarm'd all the Aſtronomers of that Age, many of whom wrote Diſſertations on it. Among the reſt *Tycho Brahe*, *Kepler*, *Maurilius*, *Licetus*, *Gramineus*, &c. *Beza*, the *Landgrave* of *Heſſe*, *Roſa*, &c. wrote to prove it a Comet, and the ſame which appeared to the *Magi* at the Birth of *Jeſus Chriſt*, and that it came to declare his ſecond Coming. *Tycho* anſwered them.

In *Perſeus* (the tenth) in *Ptolemy*'s Catalogue 29; in *Tycho*'s 29: In the *Britannick* Catalogue 67. In *Andromeda* (the eleventh) there are two Stars of the ſecond Magnitude, and very conſpicuous; another is called *Umbiliculus Andromedæ*, and another *Lucida Pedis Andromedæ*. In *Triangulum* (the twelfth) in *Ptolemy* and *Tycho*'s Catalogue 4; in the *Britannick* Catalogue 24. In *Auriga* (the thirteenth) in *Ptolemy*'s Catalogue 14; in *Tycho*'s 23; in *Hevelius* 40; in the *Britannick* Catalogue 68.

Note, That in one of theſe *Conſtellations*, called alſo *Eriſthonius*'s Shoulder, there is a very bright Star, called *Capella*, and near it three others leſſer, placed in the Form of an iſocel Triangle, called *Hædi*.

In *Pegaſus* the fourteenth, in *Ptolemy*'s Catalogue 20; in *Tycho*'s 19; in the *Britannick* Catalogue 93; in *Equuleus* (the fifteenth) in *Ptolemy*'s Catalogue 4; in *Tycho* 4; in *Flamſteed* 10. In *Delphinus* (the ſixteenth) in *Ptolemy*'s Catalogue 10; in *Tycho*'s 10; in *Flamſteed* 18. In *Sagitta* (the ſeventeenth) in *Ptolemy* and *Tycho*'s Catalogue 5. In *Flamſteed* 23. In *Aquila* (the eighteenth) in *Ptolemy*'s Catalogue 15; in *Tycho*'s 17; in the *Britannick* Catalogue 70. In this Conſtellation there is a Star of the firſt Magnitude; In *Serpentarius* (the nineteenth) in *Ptolemy*'s Catalogue 29; in *Tycho*'s 25; in the *Britannick* Catalogue 69. In *Serpens* (the twenty-firſt) in *Ptolemy*'s Catalogue 17; in *Tycho*'s 19; in the *Britannick* Catalogue 59.

Note, That to theſe twenty-one *Conſtellations* of the Northern Hemiſphere, have been added two others, *viz.* *Antinous*, and *Coma Berenices*: Tho' *Antinous* be but a Part of *Aquila*; and *Coma Berenices*, compoſed only of unformed Stars near the *Lion*'s *Tail*; though the Stars in that modern Conſtellation, are, in *Ptolemy*'s Catalogue 3; in *Tycho*'s 13; in the *Britannick* Catalogue 40.

The Stars on the Southern Side of the *Zodiack* are diſtributed into 15 *Conſtellations*, *viz.*

In *Cetus* (the firſt) in *Ptolemy*'s Catalogue there are 22 Stars; in *Tycho*'s 21; in *Hevelius*'s 22; in the *Britannick* 78. In *Eridanus Fluvius* (the ſecond) in *Ptolemy*'s Catalogue 30; in *Tycho*'s 19; in *Flamſteed*'s 68. In *Lepus* (the third) in *Ptolemy*'s Catalogue 12; in *Tycho*'s 13; in the *Britannick* 19. In *Orion* (the fourth) in *Ptolemy*'s Catalogue 37; in *Tycho*'s 62; in the *Britannick* 80.

Note, That in this *Conſtellation* there are two Stars of the firſt Magnitude, a reddiſh one in the Shoulder, called *Bellatrix*; and another Yellowiſh in the Foot. There is, beſides, in it the *Balteus*, or *Girdle*, conſiſting of three Stars. The Antients ſuppoſed that *Orion* raiſed Tempeſts at its Riſing and Setting; hence its Name *Orion* from the *Greek* ὀρίνω, to make Water.

In *Canis major* (the fifth) in *Ptolemy*'s Catalogue 18; in *Tycho*'s 13; in the *Britannick* 32.

Note, In the Mouth of *Canis major* there is a Star, the moſt brillant or ſhining of all, called *Sirius*, at which, when the *Sun* arrives, then the *Canicule*, or Dog Days begin.

In *Canis minor* (the ſixth) in *Ptolemy*'s Catalogue 17. In *Argo* (the ſeventh) in *Ptolemy*'s Catalogue 8; in *Tycho*'s 11; in the *Britannick* 25. In *Hydra* (the eighth) in *Ptolemy*'s Catalogue 25; in Dr. *Halley*'s 68. In *Crater* (the ninth) in *Ptolemy*'s Catalogue 7; in *Tycho*'s 8; in the *Britannick* 11. In *Corvus* (the tenth) in *Ptolemy*'s Catalogue 7; in *Tycho*'s 7; in the *Britannick* 10. In *Centaurus* with *Lupus* (the eleventh) in *Ptolemy*'s Catalogue 19; in *Tycho*'s 4; in the *Britannick* 13.

Note, That *Lupus*, which is conſidered as one of the *Conſtellations* of the Southern Hemiſphere, is but a Moiety or Part of one, which joined with the *Centaure* makes a whole one.

Ara (the twelfth) conſiſts of 7 Stars; whereof 5 are of the fourth Magnitude, and 2 of the fifth. This *Conſtellation* is not viſible in our Hemiſphere; no more than *Corona Meridionalis*, nor *Piſcis Auſtralis*.

Note, That the firſt who undertook to reduce the fixed Stars into a Catalogue was *Hipparchus Rhodius*, about 120 Years before *Chriſt*; in which he made Uſe of the Obſervations of *Tymocharis* and *Ariſtillus*, for about 180 before him. *Ptolemy* retained *Hypparchus*'s Catalogue; though he himſelf made Abundance of Obſervations, with a View to a new Catalogue, about the Year of *Chriſt* 880. *Albetagni*, a *Syrian*, brought down the ſame to his Time. *Anno* 1437, *Ulugh Beigh*, King of *Parthia* and *India*, made a new Catalogue of the fixed Stars; ſince tranſlated out of *Perſian* into *Latin* by Dr. *Hyde*. The Third who made a Catalogue from his own Obſervations was *Tycho Brahe*, who determined the Places of 777 Stars for the Year 1600; which *Kepler* from other Obſervations of *Tycho* afterwards increaſed to 1000, in the *Rudolphin* Tables. At the ſame Time *William*, Landgrave of *Heſſe*, with his Mathematicians, *Chriſtopher Rothmannus*, and *Juſtus Byrgius*, determined the Places of four hundred fixed Stars, by his own Obſervations, which *Hevelius* prefers to thoſe of *Tycho*'s. *Ricciolus*, in his *Aſtronomia Reformata*, determined the Places of 101 Stars for the Year 1700, from his own Obſervations; for the reſt he followed *Tycho*'s Catalogue; altering it where he thought fit. *Anno* 1677, Dr. *Halley*, in the Iſland of St. *Helena*, obſerved 350 Southern Stars, not viſible in our Horizon. The ſame Labour was repeated by *F. Noel* in 1710, who publiſhed a new Catalogue of the ſame Stars conſtructed for the Year 1687. The next was *J. Hevelius*, who made a Catalogue of 1888 fixed Stars; whereof 950 had likewiſe been obſerved by the Antients; 355 by Dr. *Halley*, and only 603 by himſelf. The *laſt* and greateſt is the *Britannick* Catalogue, compiled from *Flamſteed*'s Obſervations, who for a long Series of Years devoted himſelf wholly thereto; it contains 2734 Stars. There was another publiſhed in 1725, purſuant to his Teſtament.

Having thus paſſed through the immenſe Regions of the fixed Stars, examined attentively the various *Phænomena* and *Phaſes* of the *Sun* and *Moon*, we'll deſcend for a Time to the two lower Planets, *Venus* and *Mercury*, with the Deſign of re-aſcending again to *Mars*, *Jupiter*, and *Saturn*.

MERCURY, is ſo ſmall a Planet, that it can ſcarcely be diſtinguiſhed but by thoſe verſed in *Aſtronomy*, though almoſt equal in Radiancy, or Brightneſs to the fixed Stars; but is never ſeen, but when in a very great Digreſſion from the *Sun*, and is ſeldom diſcovered round, even by the Teleſcope, but only divided into two Parts, like the *Moon* while in the Quadratures.

The mean Diſtance of *Mercury* from the *Sun* is to

that of our Earth from the *Sun*, as 387 to 1000, its Eccentricity 8 Degrees. The Inclination of its *Orbit*, that is, the Angle formed by the Plane of its *Orbit*, with the Plane of the Ecliptick, is 6 Degrees 52 Minutes. Its Diameter to that of the Earth, as 3 to 4; and therefore the Globe of *Mercury* will be to that of the Earth, as 2 to 5. According to Sir *Isaac Newton*, the Heat and Light of the *Sun* on the Surface of *Mercury*, is seven Times as intense as on the Surface of our Earth in the Middle of Summer: Which, as he found by Experiments made for that Purpose by a Thermometer, is sufficient to make Water boil.

The Revolution of *Mercury* round the *Sun*, or his Year, is performed in 87 Days 23 Hours; his diurnal Revolution, or the Length of his Day, is not yet determined; nor is it certain, whether he has such a Motion round his own Axis or not. The Force of Gravity on his Surface, is seven Times as strong as on the Surface of the Earth. Its Density, and consequently the Gravitation of Bodies towards the Center cannot be accurately determined; but, no doubt, it must exceed that of our Earth, by Reason of the Excess of Heat there.

Mercury changes his *Phases*, like the *Moon*, according to his several Positions, with Regard to the *Sun* and Earth. Some *Astronomers* have imagined to have found him full in his superior Conjunctions with the *Sun*, because they could see, say they, the whole illuminated Hemisphere; but in his lower Conjunction they only see the obscure and unilluminated Hemisphere. In his Approach towards the *Sun*, his Light as we have already observed, is falcated and horned. *Rohault* and *Purchot* are of Opinion that he has no Light of himself, but borrows it from the *Sun*. As to his Situation, *Mercury* is sometimes observed betwixt the Earth and the *Sun*; and sometimes beyond the *Sun*. Its greatest Distance from the *Sun*, with Regard to us, never exceeds 28 Degrees, whence it is seldom visible; being commonly either lost in the *Sun*'s Light, or, when the most remote from the *Sun*, in the *Crepusculum*. The best Observations of this Planet are those made when it is seen on the *Sun*'s Disk; for in its lower Conjunction it passes before the *Sun* like a little Spot, eclipsing a small Part of his Body, which was first observed by *Cassendi* in 1632; but not without a Telescope. The following *Calculus* will elucidate the *Phænomena* and *Phases* of *Mercury*.

Mercury, seen from the *Sun* in the ascending Node, his mean diurnal Motion, is 6°, 3′, 52″. But while in the other Node, it runs only 3°, 34′, 12″. This extreme Difference of Velocity proceeds from the different Distance of *Mercury* from the *Sun*, in either Node, and depends on the Eccentricity of its *Orbit*. The diurnal Motion of *Mercury*, from the Earth, seen from the *Sun*'s Center, in the ascending Node, rises to 5 Degrees, 48 Minutes, and as many Seconds; and only one Degree, 55 Minutes, and 28 Seconds in the descending Nodes. Therefore an angular Motion of *Mercury* from the *Sun*, being given in both Nodes to an Eye placed in the Center of the *Sun*, there will likewise be given an angular Motion of *Mercury* from the *Sun*, to an Eye placed in the Center of the Earth, from the following Analogy; for as the Distance of *Mercury* from the Earth is to his Distance from the *Sun*, so is the angular Motion, lately found, of *Mercury* towards the *Sun*, to his apparent angular Motion towards the Earth, *viz.* In the ascending Node 675921 : 67591 : 31365°.–5°, 3′, 48″, in the descending Node, 55699 : 45308.–1°, 55′, 28″–1°, 55′, 28″.

The Angle whereby the Plane of *Mercury*'s *Orbit* inclines to the Ecliptick is, according to *Kepler*, of 6 Degrees and 54 Minutes. The Angle of the Way of *Mercury*, when discovered in the *Sun*'s Disk, is very little greater than the Angle whereby *Mercury*'s *Orbit* inclines to the Ecliptick; and in the Conjunction at The ascending Node, becomes of 8 Degrees and 15 Minutes, but in the Conjunction at the descending Node it increases to 10 Degrees and 18 Minutes.

The diurnal Motion of *Mercury* is greater in its own *Orbit* towards the Nodes than its diurnal Motion in the Ecliptick; and in the ascending Node it becomes of 2 Degrees, 22 Minutes, and 40 Seconds; and a little bigger towards the descending Node, in Proportion to the Angle of the apparent Way to the Ecliptick, which is easily discovered by *Trigonometry*. If there happen a Conjunction of *Mercury*, and the *Sun* in the Node, *Mercury* will pass in such a Manner through the Disk of the *Sun*, as to enter the Center of the *Sun*, and that Passage will be the slowest of all. But if the Conjunction happens a little before, or a little behind the Node, *Mercury* will also pass thro' the *Sun*, but at a greater Distance from the Center; so that he will appear then to describe a Chord, but not a Diameter of the Disk.

If it is wanted to describe the Limits of those Passages, an Angle is given of the Way seen of the Ecliptick, and of the Side opposite to it, perpendicular to the Way seen, in a Triangle rectangled, the other Sides are also given from *Trigonometry*, one whereof will determine the Longitude of *Mercury* from the *Sun* in the Ecliptick, and the other its Longitude in its proper *Orbit*, where *Mercury* will only reach, but not enter the *Sun*'s Disk.

Therefore if *Mercury* is once observed in Conjunction in either Node, at that Time, the mean annual Motions of that Planet are as often added, while its Place, through Excess or Defect, is less distant for the Place of the *Sun* than the Limits above defined, it will appear that *Mercury* must pass through the *Sun*'s Disk, before or after its Arrival at the Node. Provided we take the annual Motions, agreeable not to the current, but to the astreal Year. These Things presupposed, we'll give here the Method of the *Calculus*, as taken from Dr. *Halley*, and adapted to the ascending Node.

Let *Mercury*, retrograde, be in Conjunction with the *Sun*, in the Center, at the ascending Node, in the Month of *October*, from the abovementioned Hypotheses and Arguments we'll have,

The Sun's Longitude from the first Star of *Aries*.	S	°	′	″
	6	15	44	00
Mercury's Longitude seen from the Sun	0	15	44	00
Mercury's Parts Distance from the Sun	31365			
Mercury's Parts Distance from the Earth	67591			
The Angle of Inclination of *Mercury*'s *Orbit*	0	6	54	00
The Motion of six Hours of *Mercury* seen from the Sun	0	1	30	58
The Motion of the Sun in those six Hours	0	0	15	5
Hence (the last Number being subtracted from the first) *Mercury*'s Motion from the Sun in six Hours	0	1	15	53
And its Motion from the Sun seen from the Earth in six Hours	0	0	35	12
And the Angle of the Way of *Mercury* seen within the Sun, with the Ecliptick	0	8	15	00
Hence the visible Motion of *Mercury* in its *Orbit* for six Hours	0	0	35	40
Mercury accomplishes, besides, above four Revolutions in the Course of a Sydereal Year	1	24	45	8
Therefore in thirteen Years it accomplishes	11	21	46	44
Therefore there wants to the whole Revolutions fifty-four	0	8	13	16
		d.	h.	′
Which Space *Mercury* runs in		2	00	13
To which the Place of the Sun is removed, and *Mercury* placed in the Node, is as much distant from the Conjunction of the Earth	S.	°	′	″
	0	2	1	00
But that Arch seen from the Sun is	0	0	56	10
Whence from the Angle given of the Way, seen 8° 15′ issues the Base, or the Distance from the visible Conjunction in the Ecliptick	0	0	55	00

Which

	d.	h.	′
Which Arch *Mercury* runs, according to the horary Motion given	0	0	9 21
But thirteen *Sydereal* Years exceed as many *Julian* Years, by three Intercalations	0	0	8 00
Therefore *Mercury* returns to the *Sun*, after thirteen *Julian* Years, and above	0	2	17 34
Or with four Intercalations, if the preceding Year be the third from the *Biſſextile*	0	1	17 34
Therefore from the Arch given, 56′ 10″, and the Angle of the Way ſeen with the *Ecliptick* (8° 15′) appears, by *Trigonometry*, the Perpendicular, or neareſt Diſtance of *Mercury* from the *Sun*	0	0	8 3
Therefore *Mercury*, after 13 Years, advances, conſpicuous, within the *Sun*, northward, 8′ 3″			

	S.	°	′	″
For the ſame Reaſon, *Mercury* moves, in 46 *Sydereal* Years	11	28	36	8
Therefore it wants to 191 whole Revolutions	0	10	23	52

	h.	′
i. e. In Time, 8′ 12″	0	0 8 12

	′	″
When the *Sun* moves	0	0 20 41
This Arch ſeen from the Earth, becomes	0	0 9 36
And the Baſis competent to it	0	0 9 30

	d.	h.	′
And the Time which *Mercury* is running the Baſis, is	0	0	1 36
And 46 *Sydereal* Years exceed as many *Julian* Years, by eleven Intercalations	0	0	19 3
Mercury returns to the *Sun*, after 46 *Julian* Years, and above	0	1	4 51
Or with ſix Intercalations, as it happens when the preceding Year is the ſecond or third from the *Biſſextile*	0	0	4 51

	′	″
Therefore the Perpendicular by which *Mercury* is carried to the North, is	0	0 1 22

	°	h.	′
And the moſt accurate Period of *Mercury* to the *Sun*, is accompliſh'd in 265 *Sydereal* Years, and above	0	0	1 11½
And thoſe *Sydereal* Years ſurpaſs as many *Julian* Years by 66 Intercalations	0	0	10 20
Whence, after 265 *Julian* Years, *Mercury* is revolv'd to the *Sun*, but ſlower	0	0	11 31½
If the preceding Year has been *Biſſextile*, there muſt be added	0	1	11 31½

Laſtly, After that Interval, it advances no more than 10 Seconds northward.

Mercury's other Periods are eaſily deduc'd, from what has been obſerv'd already, and are of ſix or ſeven Years.

From this Explanation of the Conjunction of *Mercury* with the Sun at the Aſcending Node, we'll proceed to the Conjunction of the ſame Planet with the Sun at the Deſcending Node.

Therefore let *Mercury* retrograde, be in a central Conjunction with the Sun at the Deſcending Node, in the Month of *April*. From the preceding Hypotheſes we ſhall have

	S.	°	′	″
The Longitude of the Sun from the firſt Star of *Aries*	0	15	44	00
Mercury's Longitude ſeen from the Sun	6	15	44	00
Its Parts Diſtance from the Sun	45308			
The Diſtance of its Parts from the Earth	55699			
The Motion of *Mercury* ſeen from the Sun ſix Hours	0	0	43	21
The Motion of the Sun in the ſame Time	0	0	14	29
Hence, by Subtraction, the Motion of *Mercury* from the Sun, is 6 Hours	0	0	28	52
And the Angle of the Way of *Mercury*, ſeen within the Sun, with the *Ecliptick*	S.	°	′	″
	0	10	18	00
And the viſible Motion of *Mercury* in its *Orbit* 6 Hours	0	0	23	52

Whence, by following the Method of the preceding Calculus, we'll be convinc'd that *Mercury*, after 13 *Julian* Years, and above, revolves to the Conjunction of the Sun 3° 7h. 37′. If the preceding Year has been the third from the *Biſſextile*, then a Day muſt be taken from the firſt Number, and then *Mercury* will be found advancing ſouthward, 16′ 55″. Therefore after 46 *Julian* Years, with 12 Intercalations, we'll add 7h. 14′; then *Mercury* will be found in Conjunction with the Sun, in the moſt auſtral Croſſway, 2′ 53″: But if the firſt Year was *Biſſextile*, or the firſt from the *Biſſextile*, a Day muſt be added to the firſt Computation, that it might be had quite ſynodal.

Likewiſe, after 265 Years, in which *Mercury* declines to the South only 22″, there muſt be added, 1d. 11h. 49′, or, omitting the Day, 11h. 49′, according to the Rules preſcrib'd for the intercalary Year. However, *Mercury*, by reaſon of its Neighbourhood with the Earth, does not return in ſix or ſeven Years to the Sun, ſo as to be ſeen within his Diſk; but after 13 Years it paſſes the Sun, by a more northern Way, 14′ 2″; and we have the Moment of Conjunction, by ſubtracting from the Time of the firſt, 3d. oh. 23′; if it be the third Year from the *Biſſextile*; otherwiſe, ſubtracting only 2d. oh. 23′.

This being found, it will be eaſy to continue the Calculus for all theſe Conjunctions of *Mercury* with the Sun; and to diſcover, with Certitude, if they be all poſſible, or not. By the ſole Addition, the Moments of the Conjunctions, and Diſtance of the Planet from the Center of the Sun, is found.

Note, That the SYDEREAL YEAR, is the Space of Time wherein the Sun, going from any fixed Star, returns to the ſame. It conſiſts of 365 Days, 6 Hours, 10 Minutes. The *Intercalary Year*, conſiſts of 13 Lunar Civil Months; and therefore contains 384 Days. For as the Difference between the common Lunar Civil Year, and the Tropical Year, is 11 Days, 5 Hours, and 49 Minutes; to have the former keep Pace with the latter, there are 34 Months of 30 Days, and 4 Months of 31 Days each, to be inſerted in every 100 Lunar Years; which ſtill leave behind them an Appendix of 4 Hours, 21 Minutes; which, in ſix Centuries, make nearly a Day more.

Having thus explain'd the different *Phænomena* of *Mercury*, we'll pay a ſhort Viſit to *Venus*, as its next Neighbour, and which we'll find conſtantly attending the Sun, and never departing from him above 47 Degrees. When ſhe goes before the Sun, that is, riſes from him, ſhe is call'd *Phoſphorus*, or *Lucifer*, or the *Morning Star*; and when ſhe follows him, that is, ſets after him, *Heſperus*, or *Veſper*, or the *Evening Star*.

The Diameter of *Venus* is to that of the Earth, as 10 to 19; her Diſtance from the Sun is [illegible] of the Earth's Diſtance from the Sun; her Eccentricity 5; the Inclination of her *Orbit* 3° 23′; her periodical Courſe round the Sun perform'd in 224 Days, 17 Hours; and her Motion round her own Axis, in 23 Hours. Her greateſt Diſtance from the Earth, according to *Caſſini*, is 38000 Semidiameters of the Earth; and her ſmalleſt 6000. Her *Parallax* is 3 Minutes.

Venus, when view'd through a Teleſcope, is rarely ſeen to ſhine with a full Face, but has *Phaſes* juſt like thoſe of the Moon; being now gibbous, now horn'd, *&c.* and her illumin'd Part conſtantly turn'd towards the Sun, *i. e.* it looks towards the Eaſt, when *Phoſphorus*; and towards the Weſt, when *Heſperus*

De la Hire, in 1700, through a Teleſcope of 16 Feet, diſcover'd (as he pretended) Mountains in *Venus*, which he found to be larger than thoſe in the Moon. And *Caſſini*, and *Campani*, in the Years 1665 and 1666, diſcover'd Spots in her Face; from the Appearance of which, he aſcertain'd her Motion round her Axis. Sometimes ſhe is ſeen in the Diſk of the Sun, in Form of a dark round Spot. In 1672, and 1686, *Caſſini*, with a Teleſcope of 54 Feet, thought he ſaw a *Satellite* moving round this Planet, and diſtant from it about $\frac{3}{5}$ of *Venus*'s Diameter. It had the ſame *Phaſes* as *Venus*, but without any well defin'd Form, and its Diameter ſcarce exceeded $\frac{1}{4}$ of that of *Venus*.

Dr. *Gregory* thinks it's more than probable, that this was a *Satellite*; and ſuppoſes the Reaſon why it is not uſually ſeen, to be the Unfitneſs of its Surface to reflect the Rays of the Sun's Light; as is the Caſe of the Spots in the Moon: Of which, if the whole Diſk of the Moon were compos'd, he thinks that Planet could not be ſeen as far as to *Venus*.

The *Phænomena* of *Venus* evidently ſhew the Falſity of the *Ptolemaic* Syſtem: For that Syſtem ſuppoſes, that *Venus*'s Orb, or Heaven, incloſes the Earth; paſſing between the Sun and *Mercury*. And yet all our Obſervations agree, that *Venus* is ſometimes on this Side the Sun, and ſometimes on that; nor did ever any Body ſee the Earth between *Venus* and the Sun; which yet muſt frequently happen, if *Venus* revolv'd round the Earth, in a Heaven below the Sun. *Venus* is eaſily diſtinguiſh'd, by her Brightneſs, and Whiteneſs, which exceeds that of all the other Planets, and which is ſo conſiderable, that in a duſky Place ſhe projects a ſenſible Shadow. Her Place is between the Earth and *Mercury*.

The viſible Conjunctions of *Venus* with the Sun, are not ſo frequent as thoſe of *Mercury*, by reaſon of the ſlower Motion of *Venus*, whereby ſhe ſeldomer attains to the Places given. And becauſe her periodical Times, compar'd with the periodical Times of the Earth, are leſs commenſurable, and therefore very ſeldom co-incident. As to thoſe Periods, they are not ſo eaſily deſcrib'd as thoſe of *Mercury*; ſince *Venus* has never been but once, ever ſince the Creation, found within the Diſk of the Sun. But, however, the Motions being as well corrected, as the imperfect Obſervations of the Antients can allow it; we'll give this Sum of a *Calculus*.

Let *Venus* retrograde, be in a central Conjunction with the Sun, at the Aſcending Node, in the Month of *November*; then we'll have

	S.	°	′	″
The Longitude of the Aſcending Node of *Venus* from the firſt *Star* of *Aries* (the Eye being plac'd in the *Sun*)	1	15	16	00
Therefore the *Sun* is join'd to it in the oppoſite Point (*i. e.* during thoſe Centuries toward the End of *November*)	7	15	16	00
The Diſtance of the Parts of *Venus* from the *Sun*	71994			
The Diſtance from the Earth	26438			
The Inclination of *Venus* to the *Ecliptick*	0	3	23	00
The Motion of *Venus* in eight *Sydereal* Years above thirteen Revolutions	0	1	30	28½
The Motion of *Venus* in 235 *Sydereal* Years above 381 Revolutions	11	29	17	39
The Motion of *Venus* in 243 *Sydereal* Years above 395 Revolutions	0	0	48	8

The *Calculus* began on this Principle, and according to the Method given in *Mercury*'s *Calculus*, we'll have the Intervals of the Times, and Diſtances, as follows:

After eight Years, *Venus* revolves to the *Sun*; that is, having taken, from the Moment of the firſt Tranſition, 10 Hours, 52 Minutes, and a Half, the Planet advances that Way which inclines more toward the South than the firſt, by 24 Minutes, 41 Seconds.

After 235 Years, 2 Days, 10 Hours, 9 Minutes, being added, *Venus* can again enter the *Sun*, but a more northern Way, 11 Minutes, 33 Seconds.

If the preceding Year has been *Biſſextile*, we muſt add 3 Days, 10 Hours, 9 Minutes.

After 243 Years, *Venus* can alſo paſs the *Sun*, (by only taking off 43 Minutes from the Time of the firſt) but more northward, by 13 Minutes, 8 Seconds. If the preceding Year has been *Biſſextile*, add 23 Hours, 17 Minutes, of the firſt Time taken off, to compleat a whole Day; and in all thoſe Approaches of *Venus* to the *Sun*, in the Month of *November*, the Angle of the Way ſeen, of *Venus* with the *Ecliptick*, is 9 Degrees, 5 Minutes, and her horary Motion within the *Sun*, 4 Minutes, 4 Seconds; and as the Semidiameter of the *Sun* is 16 Minutes, 22 Seconds, the Duration of the Paſſage of *Venus*'s Center, muſt be 7 Hours, 56 Minutes. Theſe for *Venus*'s Conjunction at the Aſcending Node, in the Month of *November*.

As for her central Conjunction at the Deſcending Node, we muſt form our *Calculus* on the Principles before mention'd, and it will be evident, that after the ſmalleſt Interval of eight Years, 2 Days, 6 Hours, and 55 Minutes, are to be taken off, and then *Venus* will paſs through the moſt northern *Orbit* 19 Minutes, 58 Seconds. It will likewiſe be evident, that after the next Interval of 235 Years, there muſt be added, 2 Days, 8 Hours, 18 Minutes; or, if the firſt Year has been *Biſſextile*, 3 Days, 8 Hours, 18 Minutes; and then *Venus* is to paſs through a moſt northern *Orbit*, 9 Minutes, 21 Seconds. Laſtly, It will appear, that after the longeſt Interval of 243 Years, there muſt be added 1 Hour, 23 Minutes; or if the firſt Year has been *Biſſextile*, 1 Day, 1 Hour, 23 Minutes; and that at that very Time it will again be found in Conjunction with the Sun, but 10 Minutes, 37 Seconds, more toward the North.

In all the Paſſage of *Venus* within the *Sun*, at the Deſcending Node, the Angle of the Way ſeen, with the *Ecliptick*, will be 8 Degrees, 28 Minutes; the horary Motion 4 Minutes, and the longeſt Duration of the central Paſſage, 7 Hours, 56 Minutes.

As to the *Epocha's*, we muſt follow the Method before mention'd; ſince by the ſole Addition all *Phænomena* of that kind are eaſily computed. Dr. *Halley* informs us, that the next Paſſage of *Venus* will happen the 26th of *May*, 1761; and will be obſerv'd a little before Six in the Morning; and in that Paſſage, *Venus* is to be at no greater Diſtance from the *Sun*'s Center, than 1 Minute, $\frac{1}{4}$.

From the inferior *Planets*, we'll aſcend to the ſuperior ones; and from *Venus*'s inchanting Boſom, viſit *Mars*'s Fields.

MARS, *Cop. Syſ.* is one of the three ſuperior *Planets*, and of thoſe three the neareſt to us; being placed between the *Sun* and *Jupiter*. Its mean Diſtance from the *Sun*, is 1524 of thoſe Parts, whereof the Diſtance of the *Sun* from the Earth is 1000; its Eccentricity 141; the Inclination of its *Orbit*, that is, the Angle form'd by the Plane of its *Orbit* with the Plane of the *Ecliptick*, 1 Degree, 52 Minutes; the Periodical Time, in which it makes its Revolution round the *Sun*, 686 Days, 23 Hours.

In 1666, *Caſſini* obſerv'd ſeveral Spots in the two *Faces*, or Hemiſpheres of *Mars*, which he found to move by little and little, from Eaſt to Weſt, and to return in the Space of 24 Hours, 40 Minutes, to their former Station. Hence he concluded the *Planet* to turn round its own Axis, in the Space of 24 Hours, 40 Minutes.

It muſt be obſerv'd, that in the *Copernican* and *Tychonick* Hypotheſes, the Earth is contain'd within the Circumference of this Circle; and that hence *Mars* is, at certain Times, in Oppoſition to the *Sun*; that is, when near the Earth; and ſometimes *Mars* is nearer to it than the *Sun* himſelf; as it is evident in both Syſtems: And then he appears bigger to us, than

while in Conjunction with the Sun, though in Conjunction, as well as in Oppoſition, it ſhines in full Orbit; but in Conjunction he is ſuperior to the Sun, and at a greater Diſtance from us; but nearer, when in Oppoſition, in the Quadratures, he has the ſame *Phaſes* the Moon has, but they are very little ſenſible to us.

Mars always appears with a ruddy troubled Light, whence we conclude it is encompaſſed with a thick, cloudy Atmoſphere, which by diſturbing the Rays of Light in their Paſſage and Repaſſage through, it occaſions that Appearance.

Beſides this ruddy Colour of *Mars* we have another Argument of its being encompaſſed with an Atmoſphere; and it is this; that when any of the fixed Stars are ſeen near his Body, they appear extremely obſcure, and almoſt extinct. If this be the Caſe, an Eye placed in *Mars* would ſcarce ever ſee *Mercury*, unleſs perhaps in the Sun at the Time of Conjunction, when *Mercury* paſſes over his Diſk, as he ſometimes appears to us in Form of a Spot. A Spectator in *Mars* will ſee *Venus* about the ſame Diſtance from the Sun, as *Mercury* appears to us; and the Earth about the ſame Diſtance from the Sun, that to us *Venus* appears; and when the Earth is found in Conjunction with, and very near the Sun, he will ſee in *Mars* what *Caſſini* ſaw on the Earth, *viz.* the Earth appears horned or falcated, and its Attendant, the Moon, of the ſame Figure, and at its utmoſt Diſtance from the Earth not above 15 Minutes of a Degree.

Having been inſpired in *Mars*'s Field with a noble and becoming Boldneſs, we'll dare to approach *Jupiter*'s Throne; without the leaſt Fear of his Thunder.

JUPITER, 9. *Cop. Syſt.* is one of the ſuperior Planets, ſituate between *Saturn* and *Mars*, remarkable for its Brightneſs, which by its proper Motion ſeems to revolve round the Earth in about 12 Years. It has a Rotation round its own Axis in 9 Hours 56 Minutes; and a periodical Revolution round the Sun in 4332 Days, 12 Hours, 20′ 9″. It is the biggeſt of all the Planets; its Diameter, to that of the Sun appears, by Aſtronomical Obſervations, to be as 1077 is to 10,000; to that of *Saturn*, as 1077 to 889; to that of the Earth, as 1077 to 104. The Force of Gravity on its Surface is to that on the Surface of the Sun, as 797,15 is to 10,0000; to that of *Saturn*, as 797,15 to 534,337; to that of the Earth, as 797,15 to 407,832. The Denſity of its Matter is to that of the Sun, as 7404 to 10,000; to that of *Saturn*, as 7404 to 6011; to that of the Earth, as 7404 to 3921. The Quantity of Matter contained in its Body is to that of the Sun, as 9,248 to 10,000; to that of *Saturn*, as 9,248 to 4,223; to that of the Earth, as 9,248 to 0,0044.

Note, That GRAVITY is the natural Tendency, or Inclination of Bodies towards a Center. DENSITY is that Property or Habitude of Bodies, whereby they contain ſuch a Quantity of Matter under ſuch a Bulk; accordingly a Body that contains more Matter than another, under the ſame Bulk, is ſaid to be denſer than the other.

The mean Diſtance of *Jupiter* from the Sun is 5201 of thoſe Parts, whereof the mean Diſtance of the Earth from the Sun is 1000, though *Kepler* only makes it 5196 of thoſe Parts. *Caſſini* calculates *Jupiter*'s mean Diſtance from the Earth to be 115,000 Semidiameters of the Earth. *Gregory* computes the Diſtance of *Jupiter* from the Sun to be five Times as great as that of the Earth from the Sun; whence he gathers, that the Diameter of the Sun, to an Eye placed in *Jupiter*, would not be a fifth Part of what it appears to us; and therefore its Diſk would be Twenty-five Times leſs, and his Light and Heat in the ſame Proportion.

The Inclination of *Jupiter*'s Orbit, that is, the Angle formed by the Plane of its Orbit, with the Plane of the Ecliptick, is 1 Degree, 20 Minutes; its Eccentricity is 250; and *Huygens* computes its Surface to be 400 Times as large as that of our Earth. *Jupiter* has no *Parallax*, his Diſtance from the Earth being too great, to have any ſenſible Proportion to the Diameter of the Earth. Though it be the greateſt of the Planets, yet its Revolution round its Axis is the ſwifteſt, its polar Axis is obſerved to be ſhorter than its equatorial Diameter; and Sir *Iſaac Newton* determines the Difference to be as 8 to 9; ſo that its Figure is a Spheroid, and the Swiftneſs of its Rotation occaſions this Spheroidiſm to be more ſenſible than that of any other of the Planets.

Jupiter appears almoſt as large as *Venus*, but is not altogether ſo bright. He is eclipſed by the Moon, by the Sun, and even by *Mars*. He has three Appendages, called *Zones* or *Belts*, which Sir *Iſaac Newton* thinks are formed in his Atmoſphere. In theſe are ſeveral *Maculæ* or Spots, carried from Eaſt to Weſt (in a Part conſpicuous to us) in the Space of 9 Hours 56 Minutes, the Diſcovery of which is controverted between *Euſtachio*, *P. Gotignies*, *Caſſini*, and *Campani*.

In 1610, the 7th of *January*, at one the following Night, *Galilæo* diſcovered, round *Jupiter*, four little Planets or Moons, which move round him, and which he called the *Aſtra Medicæa*, and we the *Satellites* of *Jupiter*. Thoſe nearer to him move with a greater Celerity, than thoſe at a greater Diſtance. *Simon Marcus* has defined their Revolutions in the following Manner. Revolves:

The firſt and innermoſt	The Second.
d h ′ ″	d h ′ ″
1 18 28 30	3 13 18 00
The Third.	**The Fourth.**
d h ′ ″	d h ′ ″
7 03 56 34	16 18 09 15

Caſſini obſerved that the firſt or innermoſt of theſe *Satellites* of *Jupiter*, was five Semidiameters of *Jupiter*, diſtant from *Jupiter* itſelf, and made its Revolution in one Day, 18 Hours, and 32 Minutes. The Second, which is ſomewhat greater, he found eight Diameters diſtant from *Jupiter*, and its Revolution 3 Days, 13 Hours, and 12 Minutes. The Third, which is the greateſt of all, is diſtant from *Jupiter* 13 Semidiameters, and finiſhes its Courſe in 7 Days, 3 Hours, and 50 Minutes. The laſt which is the leaſt of all, is diſtant from *Jupiter* 23 Semidiameters; its Period is 16 Days, 18 Hours, and 9 Minutes.

Jupiter's *Satellites* when they enter its Shadow (like the Moon when ſhe enters the Earth's Shadow) are eclipſed, becauſe they are opake Bodies, and receive their Light from the Sun. The three firſt cauſe three Eclipſes in each Revolution. 1. When the *Satellite* enters the Diſk of *Jupiter*. 2. When the Shadow of the *Satellite* darkens the Diſk of *Jupiter*. 3. When the ſuperior Part of *Jupiter* hides the *Satellite*. 4. When the *Satellite* is immerged in *Jupiter*'s Shadow. Therefore the firſt *Satellite* cauſes Eclipſes within ſeven Days; the ſecond eight; the third four; and all together twenty-eight. The firſt *Satellite*, when arrived at the Node, cauſes four Eclipſes within ſeventeen Days. To this it may be added, that one of theſe *Satellites* ſometimes eclipſes another; where the *Phaſis* muſt be different, nay frequently oppoſite to that of the *Satellite* falling into the Shadow of *Jupiter* juſt mentioned; for in this the Eaſtern Limb immerges firſt, and the Weſtern immerges laſt; but in the others it is juſt the Reverſe. The Shadow of *Jupiter*, though it reaches far beyond its *Satellites*, yet falls ſhort of any other Planet; nor could any other Planet, *Saturn* excepted, be immerged in it, even though it were infinite. Indeed *Jupiter*'s Shadow could not reach *Saturn*, unleſs *Jupiter*'s Diameter were half that of the Sun; whereas in Effect it is not one ninth of it.

Caſſini has invented proper Tables for the Computation of the Eclipſes of the *Satellite* next *Jupiter*, which indicates the very Moment of the Eclipſe. It ſuppoſes

ſuppoſes the periodical Time of that *Satellite* to be the 2448th Part of the Periodical Time of *Jupiter* himſelf from the *Aphelion* to the *Aphelion*; whence the Equations of *Jupiter*'s Orbit, turned into Minutes, and adapted to each Revolution of the *Satellite*, can make up the principal Parts of the Equation of thoſe Eclipſes. It muſt be obſerved, that theſe Tables ſuppoſe *Jupiter*'s *Aphelion* in the Beginning of the ninth Degree of *Libra*; and that the Plane of the Orbit of the *Satellite* is ſo little diſtant from the Plane of *Jupiter*'s Orbit, as well as of the Ecliptick, that the Differences ariſing from thence are not to be minded. But however we muſt obſerve, that the Supputation of thoſe Eclipſes cannot be made with Accuracy, without another Equation, for the various Situation of the Earth, with Reſpect to *Jupiter*, which Situation, Reſtitution, Oppoſition, *i.e.* of *Jupiter* and the *Sun*, contains within itſelf $225\frac{3}{8}$ Periods of that *Satellite*. *Caſſini* is of Opinion that the Quantity of ſuch Equation does not extend further than 14′ 10″.

From this Source the *Satellite*'s ſecond Equations of $225\frac{3}{8}$ Revolutions adapted to each, entirely make up the ſecond Parts of thoſe *Eclipſes*. There could alſo have been added a Table, demonſtrating half the Stay of the *Satellite* in *Jupiter*'s Shadow, and fitted to the firſt Periods of the 2448 Parts: For, as *Jupiter* approaches the *Sun*, the Shadow increaſes and decreaſes as he recedes from the Sun. But this Equation is contained within ſo narrow a Compaſs, that it may very well be omitted. However there is added, as it ought to be, a Table, which is to demonſtrate the half Stay of the *Satellite* in *Jupiter*'s Shadow, for the different Poſition of the *Satellites* towards the Nodes and the Limits: For though the Plane of the *Equinox* of *Jupiter*, or of the Orbit of the *Satellite*, be not inclined in a great Angle, 'tis however inclined in ſome, and therefore there will be a greater Immerſion in the Shadow towards the Nodes of the Orbit than towards the Limits; which Difference, *Caſſini* (by Reaſon of the Numbers appropriated to the firſt Equation) has not judged proper to have omitted.

For the *Calculus* of theſe *Eclipſes*, the Year given muſt be found at the left of the Table of the *Epocha's* of the Revolutions of the firſt *Satellite* to *Jupiter*'s Shadow, and then we'll write down the Numbers which ſhew the Days, Hours, Minutes, and Seconds of the Revolution. We will alſo take out the Numbers diſtinguiſhed by two ſmall Squares, as ſo many Degrees of *Anomaly*. To theſe Numbers muſt be added thoſe affixed to the Month given, and to the Day of the Month, each in its Order, with the Numbers contained in the two ſmall Squares; which done, we'll gather each Proceſs into one Sum by Addition. The firſt Sum will ſhew the mean Moment of the mean *Eclipſe*; the ſecond will ſerve to find the firſt Equation, and the third the ſecond Equation.

Antony Maria Shyrlæus de Rheita, a Capuchin of *Cologne*, imagined, that beſides the four known *Satellites* of *Jupiter*, he had diſcovered five more, the 29th of *December*, *Anno* 1642, and in Honour of *Urban* VIII. the Pope then reigning, denominated them *Sidera Urbanoctoviana*. But upon *Nauda*'s communicating the Obſervation to *Gaſſendi*, who had obſerved *Jupiter* on the ſame Day, he ſoon perceived that the Capuchin had miſtaken five fixed Stars, in the Effuſion of the Water of *Aquarius*, marked in *Tycho*'s Catalogue 24, 25, 26, 27, for *Satellites* of *Jupiter*: Whence it is no wonder they ſhould appear to the Diſcoverer to move a contrary Way to that of the reſt, *viz.* from Weſt to Eaſt.

We muſt end our Journey through the Heavens at *Saturn*'s Orbit.

SATURN is of all the Planets the fartheſt from the Earth and the Sun, on which Account, though the biggeſt of all the Planets it appears the ſmalleſt, and to ſhine but with a feeble Light. Its Period, or the Space of Time wherein he revolves round the Sun (which makes his Year) according to *Kepler*, is 29 Years, 174 Days, 4 Hours, 58 Minutes, 25 Seconds, and 30 Thirds; whence his diurnal Motion muſt be 2 Minutes, 0 Seconds, 36 Thirds; though *De la Hire* makes his diurnal Motion 2 Minutes, 1 Second. The Inclination of his Plane to that of the *Ecliptick*, *Kepler* makes 2° 32′; *De la Hire* 2° 33′. Its mean Diſtance from the Sun is 326925 Semidiameters of the Earth; and from the Earth 210,000 of the ſame. Its ſmalleſt Diameter, according to *Huygens*, is 30 Seconds. The Proportion of its Diameter to that of the Earth, as 20 to 1; of its Surface to that of the Earth, as 400 to 1; of its Solidity to that of the Earth, as 1 to 8000.

The Diſtance of *Saturn* from the Sun being ten Times greater than that of the Earth from the ſame, it is found that the apparent Diameter of the Sun ſeen from him, will not exceed 3 Minutes, which is but little more than twice the Diameter of *Venus*.

It is doubted, whether or no *Saturn*, like the other *Planets*, revolves round its Axis: It does not appear, from any aſtronomical Obſervations, that he does; and there is one Circumſtance that ſhould ſeem to argue the contrary, *viz.* that whereas the Earth, and other *Planets*, which we know do revolve on their Axes, have their *Equatorial Diameters* greater than their *Polar*; nothing like this is obſerv'd in *Saturn*.

The ſuppos'd various and extraordinary *Phaſes* of *Saturn*, have long perplex'd the Aſtronomers, who could not divine the Cauſe of ſuch Irregularity. Thus *Hevelius* obſerv'd him to be ſometimes *monoſpherical*, ſometimes *triſpherical*, *ſpherico-anſated*, *elliptico-anſated*, and *ſpherico-cuſpidated*. But *Huygens* plainly ſhews, that all theſe monſtrous Appearances are owing to the Imperfection of the Teleſcopes that Author had us'd. *Huygens*, upon obſerving him very attentively with much better Glaſſes, reduc'd all his *Phaſes* to three principal ones, *viz. round*, *brachiated*, and *anſated*.

Saturn has a *Ring* peculiar to himſelf, which ſurrounds his Middle like an Arch, or like the Horizon of an *Armillary Sphere*, without touching him any where; the Diameter whereof is more than double that of the Planet which it ſurrounds; the former containing 45 Diameters of the Earth, the latter only 20. When rais'd enough to be out of the Shadow of the Body of *Saturn*, it reflects the Light of the Sun very ſtrongly. Dr. *Keill* obſerves, that the Thickneſs of the *Ring* takes up one Half of the Space between its outer, or convex Surface, and the Surface of the Planet. This *Ring* is found to be an opake, ſolid, but ſmooth, and even Body. *Galileo* firſt diſcover'd, that the Figure of *Saturn* was not round; and *Huygens*, that its Inequality was in Form of a Ring. *Caſſini* conjectures, that from ſome Zones which are ſometimes ſeen in *Saturn*, that he revolves round his own *Axis*; but thoſe Conjectures ſhould be confirm'd, or ſupported, by a vaſt Number of very accurate Obſervations.

Saturn performs his Courſe round the Sun, attended with five *Satellites*, or *Secondary Planets*; the firſt of which was diſcover'd by *Caſſini*, at the Royal Obſervatory at *Paris*, *Anno* 1672, to be diſtant from the Center of *Saturn*, a Diameter and two Thirds of the *Ring*, and to accompliſh his Courſe round *Saturn* in the Space of 4 Days, 12 Hours, and 27 Minutes. The ſecond had been long before diſcover'd by *Huygens*, and is a great deal bigger than the firſt. This is diſtant from *Saturn*'s Center, four Diameters of the *Ring*, and revolves round him in 16 Days, 23 Hours. The third was obſerv'd by *Caſſini*, *Anno* 1671, towards the latter End of *October*, in a great Digreſſion from *Saturn*, but ſoon vaniſh'd from his Sight, and could not be ſeen again till towards the 15th of *December*, and ſoon diſappear'd again, till the Beginning of *February* 1673; when it continu'd viſible for thirteen Days ſucceſſively. No other Reaſon can be aſſign'd for this Viciſſitude of Light, than that a Portion of this *Satellite* is capable to reflect the Light it receives with ſome Vivacity, the other not; juſt as we ſee it happen in the Globe of the Earth, that Part whereof which is cover'd with Water, is not apt to reflect the Rays of the Sun, while the dry Part does it

on all Sides. Therefore this *Satellite* revolves round its proper Center, or, like the Moon to the Earth, lends an Hemisphere to *Saturn*. Therefore when that Part of the *Satellite* which is semblable to the Earth's Continent, is turn'd toward us, then it renders it self visible, and vanishes from the Sight, when that Part which is like our Ocean inclines towards the Earth. The two others were also discover'd by M. *Cassini*, who is pleas'd to give us the Periodical Times of those five *Satellites* of *Saturn*, and their Distances from his Center.

Their Periodical Times, according to that most famous Astronomer, are as follow:

	Days	Hours	′	″
First *Satellite*	1	21	18	31
Second *Satellite*	2	17	41	27
Third *Satellite*	4	13	47	16
Fourth *Satellite*	15	22	41	11
Fifth *Satellite*	74	7	53	57

Their Distances from *Saturn*'s Center, are,

First *Satellite*	$4\frac{3}{8}$		1
Second *Satellite*	$5\frac{3}{5}$	Semidiameters of *Saturn*, or,	$1\frac{1}{4}$
Third *Satellite*	8		$1\frac{2}{5}$
Fourth *Satellite*	18		4
Fifth *Satellite*	54		$10\frac{1}{2}$

Diameters of *Saturn*'s *Ring*.

The great Distance between the fourth and fifth *Satellite*, gave Occasion to *Huygens* to suspect that there might be some intermediate one, or else that the fifth might have some other *Satellite* moving round it as its Center. Dr. *Halley*, in the *Philosophical Transactions*, gives us a Correction of the Theory of the Motion of the fourth *Satellite*. Its true Period he makes 15 Days, 22 Hours, 41 Minutes, 6 Seconds; its diurnal Motion, 22° 34′ 38″ 18‴; its Distance from the Center of *Saturn*, 4 Diameters of the *Ring*; and its *Orbit* to be little or nothing distant from that of the *Ring*, intersecting the *Orbit* of *Saturn* under an Angle of 23 Degrees and a Half.

From these general Observations, with regard to *Saturn*, his *Ring*, and five *Satellites*, we'll proceed to our astronomical *Calculus* on the same Subject.

1. *Saturn*'s true Place in the *Ecliptick*, or in his proper *Orbit*, and reckon'd from the first Star of *Aries*, must be taken from the *Caroline Tables*, and from the same Place that of the *annular Equinox* must be subtracted; the Numbers left will mark the true Place of *Saturn*, from the Place of the *annular Equinox*.

2. The true Place, or the Longitude of *Saturn* given, there, from a Table appropriated to that Purpose, his Right Ascension and Declension, both reported to the *Saturnian Equinox*. Therefore a Table, of 31 Degrees, must be prepared, according to the Rules of the spherical Trigonometry, and adapted to that Inclination; and afterwards a Right Ascension and Declension of *Saturn*, agreeable to the Degree found in the *Ecliptick*, from the *Equinox*, must be requir'd from that Table.

3. We must search, by this Analogy, the greatest Latitude from the *Ring* of the *Satellite*; As the Radius is to the Declension of the *Apogee* of the *Satellite*; so is the greatest Distance of the *Satellite* from the Center of *Saturn*, to the greatest Latitude of the *Satellite*, in *Apogæo* and *Perigæo*.

4. These being given, we discover the true Motion of the *Satellite* in the following Manner: We gather the mean Motions of the *Satellite*, proportionable to the Year, to the current Month, to the Days, to the Hours, and the Parts of the Hours, into one Sum; this Sum shewing then the mean Longitude of the *Satellite*, will also give us (after we shall have subtracted from it the Place of the *Apocronium*) its mean Anomaly. Searching in the little Table of Equations of a Lunar Eccentricity, an Equation adapted to that Anomaly. Which Equation of the Anomaly of the *Satellite* being either added, or subtracted from it, as the Title requires it, will give the true Longitude of the *Satellite*.

5. From the true Place of the *Satellite*, already given, by the Longitude, must be subtracted the Longitude of the *Apogee*; if the Arch left is lesser than six Signs, the *Satellite* will be seen toward the East; if greater, toward the West of *Saturn*: For as the Radius is to the Arch left; so are eight Semidiameters of the *Ring*, or the least Elongation of the *Satellite* from *Saturn*, to the Semidiameter of the *Ring* and their Parts; whereby the *Satellite* is distant from *Saturn*'s Center, towards the East, or West, at the Time given.

6. The better to have the true Latitude of the *Satellite*, either northern, or southern, from the Line of the *Anses*, we must make use of this Analogy; as the Radius is to the Cosine of the Arch left; so is the greatest Latitude, to the Latitude competent to the Time given.

Before we leave the Planetary System, it will not be improper to make, with *Rohault*, the following general Observations on the *Phases* of these three Primary Planets, *Mars*, *Jupiter*, and *Saturn*; *viz.* that those three Planets appear to revolve in such a Manner round the Sun, that the Circles they describe contain the Circle of the Earth; therefore 'tis to be believ'd that they are at a greater Distance from the Sun than the Earth. This presuppos'd, it follows, that *Mars*, *Jupiter*, and *Saturn*, must not only appear to revolve, from East to West round the Earth, in the Space of 24 Hours; but likewise to be carried by the heavenly Matter, wherein they are contain'd, in the same Sense *Mercury*, *Venus*, and the *Earth* are carried by it.

According to the same Rules of Mechanicks, the Circles describ'd by *Mars*, *Jupiter*, and *Saturn*, must be found under the *Zodiack*; and as they are greater than those describ'd by the Earth, we may easily judge, that they cannot accomplish them in so short a Time as the Earth does her's.

Though these *Planets* are always carried by a direct Motion, and are never stationary, nor retrograde; nevertheless, there must appear Stations and Retrogradations, even at the very Time they are suppos'd to happen; *viz.* retrograde Motions as often as the Earth passes between them and the Sun. For as we advance with a greater Celerity than they, towards the same Parts, we must see them every Day to answer to various Places of the Firmament, and proceed towards the Side opposite to that we are carried by. As to the Stations, they must be remark'd, before and after each Retrogradation; because the Determination of the Motion of the Earth is then, in some Measure, oblique, with respect to the Determination of the Motion of the Planet. Hence the Celerity, wherewith we are carried, has no other Effect than to make us advance in such a Manner, as we may see during several Days, and in Order, the Planet under the same Place of the Firmament.

The Planets are represented by the same Characters the Chymists use to represent their Metals by, on account of some suppos'd Analogy between those celestial, and subterraneous Bodies. *Saturn* is represented by the Character ♄. *Jupiter* by ♃. *Mars* ♂. *Venus* ♀. *Mercury* ☿. To which we now add, *Tellus*, the *Earth*, mark'd ⊕, or ♁.

All the Observations heretofore mention'd, of the *Phænomena*, *Phases*, &c. of the heavenly Bodies, have been, for the greatest Part of them, made in Places call'd *Observatories*, which are Buildings usually in Form of a Tower, rais'd on some Eminence, and cover'd with a Terrace, for making those Observations.

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ARMILLARY SPHERE, is an Astronomical Instrument, representing the several Circles of the Sphere, in their natural Order; serving to give an Idea of the Office and Position of each thereof, and to solve various Problems relating thereto. It is thus call'd, as consisting of a Number of *Fasciæ*, or Rings of Brass or other Matter, call'd by the *Latins*, *Armillæ*, from their resembling of Bracelets, or Rings for the Arm. By this it is distinguish'd from the *Globe*, which though it has all the Circles of the Sphere on its Surface, yet is not cut into *Armillæ*, or Rings, to represent the Circles simply, and alone; but exhibits also the intermediate Spaces between the Circles.

Armillary Spheres are of different Kinds, with regard to the Position of the Earth therein; but the most commonly us'd is the *Ptolemaick*; in the Middle thereof, upon its Axis, is a Ball, representing the Earth, on whose Surface are the Circles, *&c.* of the Earth. The Sphere is made to revolve about the said Axis, which remains at Rest; by which Means, the Sun's diurnal and annual Course about the Earth, are represented, according to the *Ptolemaick Hypothesis*; and even by Means hereof all Problems relating to the *Phænomena* of the Sun and Earth, are solv'd, as upon the *Celestial Globe*, and after the same Manner.

The CELESTIAL GLOBE, is an artificial Sphere, made of Metal, Plaister, Paper, or other Matter; on whose convex Surface the fix'd Stars are plac'd, at proportionable Distances, together with the principal Circles of the Sphere. The Use of this Instrument is very extensive; scarce any Thing in the *spherical Astronomy*, but may be exhibited thereby, without having recourse to *trigonometrical Calculation*. The principal Points are contain'd in the following Problems, with their Solutions; which will let the Reader enough into the Nature and Reason of this Instrument, to apply it, of his own Accord, in any other Cases.

To find, 1. The Right Ascension and Declination of a Star, represented on the Surface of the *Globe*. 2. The Longitude and Latitude of a Star. 3. The Sun's Place in the Ecliptick. 4. The Declination of the Sun. 5. The Place of a Planet, with its Right Ascension and Declination; its Longitude and Latitude, for the Time given. 6. To rectify the *Globe*, or adjust it to the Place, *&c.* so as it may represent the present State or Situation of the Heavens. 7. To know all the Stars and Planets, by Means of the *Globe*. 8. To find the Sun's Oblique Ascension, his Eastern Amplitude and Azimuth, with the Time of Rising. 9. The Sun's Oblique Descension, Western Amplitude and Azimuth, with the Time of Setting. 10. The Length of the Day and Night. 11. The Rising, Setting, and Culminating of a Star; its Continuance above the Horizon, for any Place and Day; together with its Oblique Ascension and Descension, and its Eastern and Western Amplitude and Azimuth. 12. The Altitude of the Sun, or a Star, for any given Hour of the Day or Night. 13. The Altitude of the Sun by Day, or of a Star by Night, being given; to find the Time of that Day or Night. 14. To find the Interval of Time between the Rising of two Stars, or their Culminations. And, 15. To find the Beginning and Ending of the *Crepusculum*, or Twilight.

1. The Right Ascension and Declension of a Star is found, by bringing the Star to the graduated Side of the brazen Meridian; then the Number of Degrees intercepted between the Equator and the Point of the Meridian cut by the Star, gives its Declination; and the Degree of the Equator which comes under the Meridian together with the Star, is its Right Ascension.

2. By applying the Center of the Quadrant of Altitude over the Pole of the Ecliptick, in the same Hemisphere with the Star, and bringing its graduated Edge to the Star; the Degree on the Quadrant cut by the Star, is the Star's Latitude, reckon'd from the Ecliptick; and the Degree of the Ecliptick cut by the Quadrant, its Longitude.

3. If we seek the Day of the Month in the proper Calendar on the Horizon, we'll find against that Day in the Circle of Signs, the Sign and Degree the Sun is in for that Day. This done, by finding the same Sign upon the Ecliptick on the Surface of the *Globe*, we'll have found the Sun's Place for that Day.

4. The Sun's Place for the Day given being brought to the Meridian, the Degrees of the Meridian intercepted between the Equinoctial and that Place, are the Sun's Declination for that Day, at Noon.

5. Apply the Center of the Quadrant of Altitude, on the Pole of the Ecliptick, of the same Denomination with the Latitude, and bring it to the given Longitude in the Ecliptick; this Point is the Planet's Place: And bringing it to the Meridian, its Right Ascension and Declination will be found.

6. To rectify the *Globe*, &c. 1. If the Place be in North Latitude, the North Pole must be rais'd above the Horizon; if in the South, the South Pole. 2. The Quadrant of Altitude is to be fix'd on the Zenith, *i. e.* on the Latitude of the Place. 3. By Means of a Compass, or Meridian Line, the *Globe* must be plac'd in such a Manner, as that the brazen Meridian may be in the Plane of the terrestrial Meridian. 4. The Degree of the Ecliptick the Sun is in, must be brought to the Meridian, and the horary Index set to 12: Thus will the *Globe* exhibit the Face of the Heavens for the Noon of that Day. 5. By turning the *Globe* till the Index comes to any other given Hour: Thus will the *Globe* shew the Face of the Heavens for that Time.

on all Sides. Therefore this *Satellite* revolves round its proper Center, or, like the Moon to the Earth, lends an Hemiſphere to *Saturn*. Therefore when that Part of the *Satellite* which is ſemblable to the Earth's Continent, is turn'd toward us, then it renders it ſelf viſible, and vaniſhes from the Sight, when that Part which is like our Ocean inclines towards the Earth. The two others were alſo diſcover'd by M. *Caſſini*, who is pleas'd to give us the Periodical Times of thoſe five *Satellites* of *Saturn*, and their Diſtances from his Center.

Their Periodical Times, according to that moſt famous Aſtronomer, are as follow:

	Days	Hours	′	″
Firſt *Satellite*	1	21	18	31
Second *Satellite*	2	17	41	27
Third *Satellite*	4	13	47	16
Fourth *Satellite*	15	22	41	11
Fifth *Satellite*	74	7	53	57

Their Diſtances from *Saturn*'s Center, are,

Firſt *Satellite*	$4\frac{1}{8}$	Semidiameters of *Saturn*, or,	1
Second *Satellite*	$5\frac{1}{5}$		$1\frac{1}{4}$
Third *Satellite*	8		$1\frac{2}{3}$
Fourth *Satellite*	18		4
Fifth *Satellite*	54		$10\frac{1}{2}$

Diameters of *Saturn*'s *Ring*.

The great Diſtance between the fourth and fifth *Satellite*, gave Occaſion to *Huygens* to ſuſpect that there might be ſome intermediate one, or elſe that the fifth might have ſome other *Satellite* moving round it as its Center. Dr. *Halley*, in the *Philoſophical Tranſactions*, gives us a Correction of the Theory of the Motion of the fourth *Satellite*. Its true Period he makes 15 Days, 22 Hours, 41 Minutes, 6 Seconds; its diurnal Motion, 22° 34′ 38″ 18‴; its Diſtance from the Center of *Saturn*, 4 Diameters of the *Ring*; and its *Orbit* to be little or nothing diſtant from that of the *Ring*, interſecting the *Orbit* of *Saturn* under an Angle of 23 Degrees and a Half.

From theſe general Obſervations, with regard to *Saturn*, his *Ring*, and five *Satellites*, we'll proceed to our aſtronomical *Calculus* on the ſame Subject.

1. *Saturn*'s true Place in the *Ecliptick*, or in his proper *Orbit*, and reckon'd from the firſt Star of *Aries*, muſt be taken from the *Caroline Tables*, and from the ſame Place that of the *annular Equinox* muſt be ſubtracted; the Numbers left will mark the true Place of *Saturn*, from the Place of the *annular Equinox*.

2. The true Place, or the Longitude of *Saturn* given, there, from a Table appropriated to that Purpoſe, his Right Aſcenſion and Declenſion, both reported to the *Saturnian Equinox*. Therefore a Table, of 31 Degrees, muſt be prepared, according to the Rules of the ſpherical Trigonometry, and adapted to that Inclination; and afterwards a Right Aſcenſion and Declenſion of *Saturn*, agreeable to the Degree found in the *Ecliptick*, from the *Equinox*, muſt be requir'd from that Table.

3. We muſt ſearch, by this Analogy, the greateſt Latitude from the *Ring* of the *Satellite*; As the Radius is to the Declenſion of the *Apogee* of the *Satellite*; ſo is the greateſt Diſtance of the *Satellite* from the Center of *Saturn*, to the greateſt Latitude of the *Satellite*, in *Apogæo* and *Perigæo*.

4. Theſe being given, we diſcover the true Motion of the *Satellite* in the following Manner: We gather the mean Motions of the *Satellite*, proportionable to the Year, to the current Month, to the Days, to the Hours, and the Parts of the Hours, into one Sum; this Sum ſhewing then the mean Longitude of the *Satellite*, will alſo give us (after we ſhall have ſubtracted from it the Place of the *Aparsium*) its mean Anomaly. Searching in the little Table of Equations of a Lunar Eccentricity, an Equation adapted to that Anomaly. Which Equation of the Anomaly of the *Satellite* being either added, or ſubtracted from it, as the Title requires it, will give the true Longitude of the *Satellite*.

5. From the true Place of the *Satellite*, already given, by the Longitude, muſt be ſubtracted the Longitude of the *Apogee*; if the Arch left is leſſer than ſix Signs, the *Satellite* will be ſeen toward the Eaſt; if greater, toward the Weſt of *Saturn*: For as the Radius is to the Arch left; ſo are eight Semidiameters of the *Ring*, or the leaſt Elongation of the *Satellite* from *Saturn*, to the Semidiameter of the *Ring* and their Parts; whereby the *Satellite* is diſtant from *Saturn*'s Center, towards the Eaſt, or Weſt, at the Time given.

6. The better to have the true Latitude of the *Satellite*, either northern, or ſouthern, from the Line of the *Anſes*, we muſt make uſe of this Analogy; as the Radius is to the Coſine of the Arch left; ſo is the greateſt Latitude, to the Latitude competent to the Time given.

Before we leave the Planetary Syſtem, it will not be improper to make, with *Rohault*, the following general Obſervations on the *Phaſes* of theſe three Primary Planets, *Mars*, *Jupiter*, and *Saturn*; *viz.* that thoſe three Planets appear to revolve in ſuch a Manner round the Sun, that the Circles they deſcribe contain the Circle of the Earth; therefore 'tis to be believ'd that they are at a greater Diſtance from the Sun than the Earth. This preſuppos'd, it follows, that *Mars*, *Jupiter*, and *Saturn*, muſt not only appear to revolve, from Eaſt to Weſt round the Earth, in the Space of 24 Hours; but likewiſe to be carried by the heavenly Matter, wherein they are contain'd, in the ſame Senſe *Mercury*, *Venus*, and the *Earth* are carried by it.

According to the ſame Rules of Mechanicks, the Circles deſcrib'd by *Mars*, *Jupiter*, and *Saturn*, muſt be found under the *Zodiack*; and as they are greater than thoſe deſcrib'd by the Earth, we may eaſily judge, that they cannot accompliſh them in ſo ſhort a Time as the Earth does her's.

Though theſe *Planets* are always carried by a direct Motion, and are never ſtationary, nor retrograde; nevertheleſs, there muſt appear Stations and Retrogradations, even at the very Time they are ſuppos'd to happen; *viz.* retrograde Motions as often as the Earth paſſes between them and the Sun. For as we advance with a greater Celerity than they, towards the ſame Parts, we muſt ſee them every Day to anſwer to various Places of the Firmament, and proceed towards the Side oppoſite to that we are carried by. As to the Stations, they muſt be remark'd, before and after each Retrogradation; becauſe the Determination of the Motion of the Earth is then, in ſome Meaſure, oblique, with reſpect to the Determination of the Motion of the Planet. Hence the Celerity, wherewith we are carried, has no other Effect than to make us advance in ſuch a Manner, as we may ſee during ſeveral Days, and in Order, the Planet under the ſame Place of the Firmament.

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2. By applying the Center of the Quadrant of Altitude over the Pole of the Ecliptick, in the same Hemisphere with the Star, and bringing its graduated Edge to the Star; the Degree on the Quadrant cut by the Star, is the Star's Latitude, reckon'd from the Ecliptick; and the Degree of the Ecliptick cut by the Quadrant, its Longitude.

3. If we seek the Day of the Month in the proper Calendar on the Horizon, we'll find against that Day in the Circle of Signs, the Sign and Degree the Sun is in for that Day. This done, by finding the same Sign upon the Ecliptick on the Surface of the *Globe*, we'll have found the Sun's Place for that Day.

4. The Sun's Place for the Day given being brought to the Meridian, the Degrees of the Meridian intercepted between the Equinoctial and that Place, are the Sun's Declination for that Day, at Noon.

5. Apply the Center of the Quadrant of Altitude, on the Pole of the Ecliptick, of the same Denomination with the Latitude, and bring it to the given Longitude in the Ecliptick; this Point is the Planet's Place: And bringing it to the Meridian, its Right Ascension and Declination will be found.

6. To rectify the *Globe*, &c. 1. If the Place be in North Latitude, the North Pole must be rais'd above the Horizon; if in the South, the South Pole. 2. The Quadrant of Altitude is to be fix'd on the Zenith, *i. e.* on the Latitude of the Place. 3. By Means of a Compass, or Meridian Line, the *Globe* must be plac'd in such a Manner, as that the brazen Meridian may be in the Plane of the terrestrial Meridian. 4. The Degree of the Ecliptick the Sun is in, must be brought to the Meridian, and the horary Index set to 12: Thus will the *Globe* exhibit the Face of the Heavens for the Noon of that Day. 5. By turning the *Globe* till the Index comes to any other given Hour: Thus will the *Globe* shew the Face of the Heavens for that Time.

7. The Stars and Planets are eaſily known, by Means of the *Globe*; if, 1. We adjuſt the *Globe* to the State of the Heavens for that Time. 2. If we look on the *Globe* for ſome one Star which we know, *e. gr.* the middlemoſt Star in the Tail of the *Great Bear*. 3. If we obſerve the Poſition of the other moſt conſpicuous Stars in the ſame Conſtellation; for by transferring the Eye from the *Globe* to the Heavens, we'll eaſily note the ſame there. 4. Thus we may proceed from this to the neighbouring Conſtellations, till we have learn'd them all. If the Planets be repreſented on the *Globe* after the Manner above deſcrib'd, by comparing them with the neighbouring Stars, we'll likewiſe know the Planets.

8. By rectifying the *Globe* for the Hour of Twelve, and bringing the Sun's Place to the Eaſtern Side of the Horizon, the Number of Degrees then intercepted between that Degree of the Equator now come to the Horizon, and the Beginning of *Aries*, is the Sun's Oblique Aſcenſion. The Degrees on the Horizon intercepted between the Eaſt Point thereof, and the Point wherein the Sun is, is the Ortive, or Riſing Amplitude. The Hour pointed to by the Index, is the Time of the Sun's Riſing. Turning the *Globe* till the Index points to the preſent Hour, we muſt lay the Quadrant to the Sun's Place, the Degree cut by the Quadrant, in the Horizon, is the Sun's Azimuth.

9. The Sun's Oblique Deſcenſion, Weſtern Amplitude, and Azimuth, with the Time of Setting, is found in the ſame Manner, as its Oblique Aſcenſion, Eaſtern Amplitude, *&c.* excepting that the Sun's Place muſt be here brought to the Weſtern Side of the Horizon; as in the former it was to the Eaſtern.

10. The Length of Day and Night is found, 1. By finding the Time of the Sun's Riſing; which being number'd from Midnight, the Double thereof gives the Length of the Night. 2. By ſubtracting the Length of the Night from the whole Day, or 24 Hours, the Remainder is the Length of the Day.

11. Having adjuſted the *Globe* to the State of the Heavens at Twelve o'-Clock that Day, we'll find the Eaſtern Amplitude, Azimuth, and the Time of Riſing of a Star, by bringing the Star to the Eaſtern Side of the Horizon; and by bringing the ſame Star to the Weſtern Side of the Horizon, we'll find its Weſtern Amplitude, and Azimuth, and the Time of its Setting. The Time of Riſing ſubtracted from that of Setting, leaves the Continuance of the Star above the Horizon; and this Continuance above the Horizon ſubtracted from 24 Hours, leaves the Time of its Continuance below the Horizon. Laſtly, The Hour to which the Index points when the Star is brought to the Meridian, gives the Time of Culmination.

Note, That CULMINATION, is the Tranſit of a Star, or Planet, over the Meridian; or that Point of its *Orbit* wherein it is at its greateſt Altitude. Hence a Star is ſaid to *Culminate*, when it paſſes the Meridian.

12. The Altitude of the Sun, or a Star, for any given Hour of the Day, or Night, is found; 1. By adjuſting the *Globe* to the Poſition of the Heavens, and turning it till the Index points at the given Hour. 2. Then fixing on the Quadrant of Altitude at 90 Degrees from the Horizon, and bringing it to the Sun's or Star's Place, the Degrees of the Quadrant intercepted between the Horizon and the Sun or Star, is the Altitude requir'd.

13. The Altitude of the Sun by Day, or of a Star by Night, being given; the Time of that Day or Night is found, 1. By rectifying the *Globe* as in the preceding Problem. 2. By turning the *Globe* and Quadrant till ſuch Time as the Star, or Degree of the Ecliptick the Sun is in, cut the Quadrant in the given Degree of Altitude; then does the Index point at the Hour ſought.

14. By rectifying the *Globe*, and bringing the Quadrant to the given Azimuth in the Horizon, and turning the *Globe* till the Star comes to the ſame; the Index will ſhew the Time of Day or Night.

15. If the Pole of the *Globe* is rais'd ſo many Degrees above the Horizon, as is the Elevation of the Pole of the Place; if the firſt Star is brought to the Horizon, and the Time obſerv'd the Index points to; if the ſame be done by the other Star; then by ſubtracting the former Time from the latter, the Remainder is *the Interval between the Riſings of the two Stars.*

16. The *Crepuſculum*, or Twilight, is found, by firſt rectifying the *Globe*, and ſetting the Index to the twelfth Hour, the Sun's Place being in the Meridian. 2. By noting the Sun's Place, and turning the *Globe* Weſtward, as alſo the Quadrant of Altitude, till the Point oppoſite to the Sun's Place cut the Quadrant of Altitude in the eighteenth Degree above the Horizon, the Index will ſhew the Time when the Twilight commences in the Morning. 3. By taking the Point oppoſite to the Sun, bringing it to the Eaſtern Hemiſphere, and turning it till it meet with the Quadrant of Altitude in the eighteenth Degree, then will the Index ſhew the Time when Twilight ends.

An ASTRONOMICAL QUADRANT T, is an Inſtrument uſually made of Braſs, ſometimes of wooden Bars, only fac'd with Plates of Iron, or the like; having its Limb curiouſly divided, diagonally, or otherwiſe, into Degrees and Minutes, and even Seconds, if poſſible; with plain Sights fix'd to one Side of it, or, inſtead thereof, a Teleſcope; and an Index moving about the Center, carrying either plain Sights, or a Teleſcope. Theſe *Quadrants* are of principal Uſe, in taking Obſervations of the Sun, Planets, or fix'd Stars. The *Antients* uſed only plain Sights, but the *Moderns* have found it of great Benefit to uſe Teleſcopes inſtead of them. And the Contrivance of moving the Index, by the Help of a Screw on the Edge of the Limb, and of readily and eaſily directing it, and the *Quadrant* upon its Pedeſtal, to any deſir'd *Phænomenon*, by Means of the Screws and dented Wheels, is a ſtill greater Improvement of the Inſtrument, whoſe Uſe is obvious; for it being adjuſted, as above, and turn'd horizontally round on its Axis till through the moveable Teleſcope the Object be ſeen to fall in with the Point of Interſection of the Croſs Bars; the Degrees cut by the Index, give the Altitude requir'd.

Gunter's QUADRANT, thus called from the Inventor's Name, *Edmund Gunter*, beſides the graduated Limb, fixed Sights, and a Plummet, as the other *Quadrants*; has likewiſe a Stereographical Projection of the Sphere on the Plane of the Equinoctial, with the Eye placed in one of the Poles; by which, beſides the common Uſes of other Quadrants, ſeveral uſeful Queſtions in *Aſtronomy* are eaſily ſolv'd, *viz.* To find, 1. The Sun's Meridian Altitude for any given Day, or the Day of the Month for any given Meridian Altitude. 2. The Hour of the Day. 3. The Sun's Declination from his Place given, and contrariwiſe. 4. His Right Aſcenſion, or contrarily. 5. His Azimuth, and contrariwiſe. 6. The Hour of the Night, from ſome of the five Stars laid down on the *Quadrant*.

1. The Thread being laid to the Day of the Month in the Scale next the Limb; the Degree it cuts in the Limb, is the Meridian Altitude of the Sun. Thus the Thread being laid on the 15th of *May*, cuts 59° 30′, the Altitude ſought. And contrarily, the Thread being ſet to the Meridian Altitude, will ſhew the Day of the Month.

2. Having put the Bead, which ſlides on the Thread, to the Sun's Place in the Ecliptick, the Sun's Altitude muſt be obſerv'd by the *Quadrant*; then, if the Thread be laid over the ſame in the Limb, the Bead will fall upon the Hour requir'd. Thus, ſuppoſe on the 10th of *April*, the Sun being then in the Beginning

ning of *Taurus*, we obſerve the *Sun*'s Altitude by the *Quadrant* to be 36°, we place the Bead to the Beginning of *Taurus* in the *Ecliptick*, and lay the Thread over 36° of the Limb; and find the Bead to fall upon the Hour-Line mark'd 3 and 9; accordingly, the Hour is either 9 in the Morning, or 3 in the Afternoon. Again, laying the Bead on the Hour given, (having firſt rectified, or put it to the *Sun*'s Place) the Degree cut by the Thread on the Limb, gives the *Altitude*. *Note*, That the Bead may alſo be rectified, by bringing the Thread to the Day of the Month, and the Bead to the Hour-Line of 12.

3. Setting the Bead to the *Sun*'s Place in the *Ecliptick*, and moving the Thread to the Line of *Declination*, the Bead will cut the Thread of *Declination* requir'd. Contrarily, the Bead being adjuſted to a given *Declination*, and the Thread mov'd to the *Ecliptick*, the Bead will cut the *Sun*'s Place.

4. We muſt lay the Thread on the *Sun*'s Place in the *Ecliptick*, and the Degree it cuts on the Limb, is the *Right Aſcenſion of the Sun*. Contrarily, laying the Thread on the *Right Aſcenſion*, it cuts the *Sun*'s Place in the *Ecliptick*.

5. Rectify the Bead for the Time, (as in the ſecond Article) and obſerve the *Sun*'s *Altitude*; bring the Thread to the *Complement* of that *Altitude*; thus the Bead will give the *Azimuth* ſought, among the *Azimuth* Lines.

Note, That the AZIMUTH of the *Sun*, or a *Star*, is an Arch of the Horizon comprehended between the Meridian of the Place, and any given *Vertical*. The *Azimuth* is the *Complement* of the eaſtern and weſtern *Amplitude* of a *Quadrant*.

6. Fit the Bead to the *Star* you intend to obſerve, and find how many Hours it is off the Meridian, (by the ſecond Article) then from the *Right Aſcenſion* of the *Star*, ſubtract the *Sun*'s *Right Aſcenſion*, converted into Hours; and mark the Difference; which Difference added to the obſerv'd Hour of the *Star* from the Meridian, ſhews how many Hours the *Sun* is gone from the Meridian, which is the Hour of the Night. Suppoſe, for Example, on the 15th of *May* the *Sun* being in the 4th Degree of *Gemini*, I ſet the Bead to *Arcturus*; and obſerving his *Altitude*, find him to be in the Weſt, about 52° high, and the Bead to fall on the Hour-Line of 2 Afternoon; then will the Hour be 11 Hours, 50 Minutes paſt Noon, or 10 Minutes ſhort of Midnight. For 62°, the *Sun*'s *Right Aſcenſion*, converted into Time, makes 4 Hours, 8 Minutes, which ſubtracted from 13 Hours, 58 Minutes, the *Right Aſcenſion* of *Arcturus*, the Remainder will be 9 Hours, 50 Minutes; which added to 2 Hours, the obſerv'd Diſtance of *Arcturus* from the Meridian, ſhews the Hour of the Night to be 11 Hours, 50 Minutes.

A SEXTANT, is an *Aſtronomical Inſtrument*, made like a *Quadrant*; excepting that its Limb only comprehends 60 Degrees. The Uſe and Application of the *Sextant*, is the ſame with that of the *Quadrant*.

The Motions, Places, and other *Phænomena* of the *Planets*, both *Primary* and *Secondary*, are alſo digeſted, or computed into what we call *Aſtronomical Tables*. The oldeſt of them are the *Ptolemaick*, found in *Ptolemy*'s *Almageſt*; but theſe no longer agree with the Heavens. In 1252, *Alphonſo* XI, King of *Caſtile*, undertook the correcting them, chiefly by the Aſſiſtance of *Iſaac Azan*, a *Jew*; and ſpent 400,000 Crowns therein. Thus aroſe the *Alphonſine Tables*, to which that Prince himſelf prefix'd a Preface. But their Deficiency was ſoon perceiv'd by *Purbachius* and *Regiomontanus*; upon which, *Regiomontanus*, and after him *Waltherus*, and *Warnerus*, applied themſelves to Celeſtial Obſervations, for the farther amending them; but Death prevented any Progreſs therein.

Copernicus, in his Book of the Celeſtial Revolutions, inſtead of the *Alphonſine Tables*, gives others of his own Calculation, from the latter, and partly from his own Obſervations. From *Copernicus*'s Obſervations and Theories, *Eraſmus Reinholdus* compil'd the *Prunetick Tables*. But *Tycho Brahe*, becoming ſenſible, even in his Youth, of the Deficiency of them, applied himſelf, with a great deal of Aſſiduity, to Celeſtial Obſervations; yet all he gain'd thereby, was, to adjuſt the Motions of the *Sun* and *Moon*; though *Longomontanus*, from the ſame, to the Theories of the ſeveral *Planets* publiſh'd in his *Aſtronomia Danica*, added *Tables* of their Motions, now call'd the *Daniſh Tables*; and *Kepler*, likewiſe, from the ſame, in 1627, publiſh'd the *Rudolphine Tables*, which are, now, much eſteem'd. Theſe were afterwards, *Anno* 1650, turn'd into another Form, by *Maria Cunitia*, whoſe *Aſtronomical Tables*, comprehending the Effect of *Kepler*'s *Phyſical Hypotheſis*, are exceedingly eaſy, and ſatisfy all the *Phænomena*, without any Trouble of Calculation, or any Mention of *Logarithms*; ſo that the *Rudolphine Calculus* is here greatly improv'd.

Mercator made a like Attempt, in his *Aſtronomical Inſtitution*, publiſh'd in 1676; and the like did *J. Baptiſt Marini*, whoſe Abridgment of the *Rudolphine Tables* was prefix'd to a *Latin* Verſion of *Street*'s *Aſtronomia Carolina*, publiſh'd in 1705. *Lanſbergius*, indeed, endeavour'd to diſcredit the *Rudolphine Tables*, and fram'd *Perpetual Tables*, as he calls them, of the Heavenly Motions; but his Attempt was never much regarded by the Aſtronomers; and *Horrox* gave a ſufficient Check to his Arrogance, in his Defence of the *Keplerian Aſtronomy*. Nor was the Authority of the *Rudolphine Tables* impair'd by the *Philolaick Tables* of *Bullialdus*'s *Hypotheſis*; or the *Britannick Tables* of *John Newton*; or the *French* ones of the Count *De Pagan*; or the *Caroline Tables* of *Thomas Street*; all calculated on Dr. *Ward*'s *Hypotheſis*; or the *Novalageſtick Tables* of *Ricciolus*.

The lateſt *Tables* are the *Ludovician*, publiſh'd in 1702, by M. *De la Hire*, wholly from his own Obſervations, and without the Aſſiſtance of any *Hypotheſis*.

We deſign'd to prefix the *Caroline Tables* to this *Treatiſe* of *Aſtronomy*; but as they'll take up ſeveral Sheets of Paper, and conſequently would perhaps appear too tedious, to thoſe of our *Subſcribers* who have no Tincture of *Aſtronomy*; we'll defer publiſhing them, till the latter End of this Work, when the *Subſcribers* will have them Time enough to bind with the reſt of the Book.

The Invention of *Aſtronomy* remains yet a Problem; though *Belus*, King of *Aſſyria*, *Atlas*, King of *Mauritania*, &c. are complimented with having been the firſt Inventors and Cultivators of it. For this Reaſon it is, perhaps, that *Plato* tells us, that it was a *Barbarian* who firſt obſerv'd the *Heavenly Motions*, induced to it by the Clearneſs of the Weather in the *Summer Seaſon*, as in *Egypt* and *Syria*, where the *Stars* are conſtantly ſeen, there being no Rain or Clouds to interrupt the Proſpect. And the Want of this Clearneſs of *Atmoſphere*, the ſame Author lays down as the Reaſon why the *Greeks* came ſo late to the Knowledge of *Aſtronomy*.

Some Authors attribute to the *Chaldeans* the Invention of *Aſtronomy*, as well as of *Aſtrology*; and pretend, that a *Chaldean*, *Aſtronomer*, and *Aſtrologer* are ſynonymous. Others conſider the *antient Hebrews* as the firſt Inventors of *Aſtronomy*; and pretend, that our *Protoplaſtus Adam* applied himſelf to it: Though I am of a different Opinion; for he muſt have done it, while in the Garden, or after he had been expell'd from it. If in the Garden, and in his State of Innocence, what could he have diſcover'd then, of this viſible World, which had not been reveal'd to him by his divine Creator; and could he have any Ambition to penetrate further into the Myſtery of the Creation, than what could contribute toward advancing his temporal Felicity, which was then ſo perfect, as to be impoſſible for him to make the leaſt Addition to it by any new Diſcovery? It muſt be ſuppos'd, that he

knew

knew enough, then, of the *Motion* of the *Heavens*, (which he had all the Reaſon to believe were form'd for him, and conſequently ſhould always move in that juſt Order eſtabliſh'd among them, and neceſſary to cauſe thoſe *periodical Mutations*, which ſhould always render his tranſitory Manſion enchanted, and fortunate) to raiſe his Thoughts from the Admiration of that inimitable Piece of Workmanſhip, to the Contemplation of the divine Perfections of the great Architect. Why even ſhould we not ſuppoſe that *Adam* had by Infuſion, and from the firſt Inſtant of his Creation, what we have ſo long attempted in vain to gain by Art, a perfect Knowledge of the *Motions* of the *Heavens*, of the *Number* of the *fixed Stars*, of the *Diſtances* of the *Planets*, of their *Revolutions*, *Phaſes*, *Phænomena*, &c. and if not, had it not been a Crime in him to have attempted in the Garden the Diſcovery of what the *Almighty* had judg'd proper to hide from him? But perhaps he did not become an Aſtronomer till after he had forfeited his Innocence, and made a ſort of Divorce with his Senſes and Reaſon; *i. e.* after his Expulſion from the Garden; which I can ſcarcely believe, eſpecially when I reflect on that ſevere Puniſhment inflicted on him, by his offended Creator, *In ſudore vultus tui veſceris Panem*; In the Sweat of thy Brow ſhalt thou eat thy Bread: Which makes me ſuppoſe that he could not ſpare Time enough to make *aſtronomical Obſervations*.

Rudbeck, with more Appearance of Reaſon, compliments the *Swedes*, in his *Atlantica*, with the Invention of *Aſtronomy*, founded on the great Diverſity in the Length of the Days in that Country, which he ſuppoſes muſt naturally lead the People to conclude the *Earth* round, and that they live near one of its Extremes; and that prompted thereby to enquire further into the great Oppoſition of Seaſons, the *Swedes* ſoon diſcover'd that the *Sun* bounds its Progreſs by a certain Space in the Heavens, *&c.* which *Sentiment* would be more agreeable to Reaſon, if ſupported by hiſtorical Facts, which are not to be met with.

Porphyry would have the Origin of *Aſtronomy* traced as far as the Building of *Babel*, and inſinuates, perhaps, that *that* monſtrous Edifice was erected for an *Obſervatory*, from whence *Nimrod*, the Projector of the Work, could have eaſier peep'd into Heaven, (being himſelf of a very tall Stature) than ever *Caſſini* or *Flamſteed* did, even with the Aſſiſtance of their moſt monſtrous *Teleſcopes*. But if the *Almighty* was provok'd at their too great Curioſity, or not, the Truth is, if we believe *Moſes*, that he confounded the Underſtanding of the Aſtronomers, a Malady, which has been ſince hereditary, more or leſs, in the *Family*; though, if we believe *Porphyry*, there were found in *Babylon*, when taken by *Alexander*, *Celeſtial Obſervations* for the Space of 1903 Years, which therefore muſt have commenc'd within 115 Years of the Flood, or 15 Years of the Building of *Babel*.

Achilles Tatius, with far greater Foundation, conſiders the *Egyptians* as the firſt Inventors of *Aſtronomy*, who took Care to have their Knowledge therein tranſmitted to Poſterity, by having it engraven on Columns and Pyramids. *Laertius* informs us, that from the *Egyptians*, *Aſtronomy* paſs'd to the *Greeks*, and that *Thales Mileſius* firſt, about the *19th Olympiad*, and after him *Eudoxus* and *Pythagoras*, travell'd into *Egypt* to be inſtructed therein.

Pythagoras, after he had liv'd in a cloſe Community with the *Egyptian* Prieſts for ſeven Years, and had been initiated into their Religion, where he was let into the true Syſtem of the Univerſe; paſs'd afterward into *Greece* and *Italy*, where he taught the firſt *Elements* of that curious, though very *intricate Science*. He had made ſo conſiderable a Progreſs in it, that he went further in his Diſcoveries, than his Maſters; for he was the firſt who placed the *Sun* in the *Center* of the *Syſtem*, and made the *Earth* and *Planets* to turn round him. Suppoſing the *diurnal Motion* of the *Sun* and *fixed Stars* to proceed from the *Earth's Motion* round its own Axis, and conſequently apparent only, and not real. After *Pythagoras*, *Aſtronomy* ſunk into Neglect; moſt of the Obſervations brought from *Babylon* were loſt, and *Ptolemy* could recover but a very ſmall Number of them. However, *Philolaus* and *Ariſtarchus Samius*, with a few more of his Diſciples, continu'd to cultivate *Aſtronomy*.

It continu'd in that languiſhing State, till the *Ptolemies*, Kings of *Egypt*, declar'd themſelves its Protectors, by erecting an Academy at *Alexandria*, which produc'd ſeveral eminent Aſtronomers; and, among the reſt, *Hipparchus*, who undertook to number the *Stars*, and to leave the Heavens as an Inheritance to Poſterity. He foretold the *Eclipſes*, both of the *Sun* and *Moon*, for 600 Years; and on his *Obſervations* is founded *Ptolemy's* Μεγαλησυνταξις.

Aſtronomy was a-freſh introduc'd into *Europe*, after ſeveral Ages Exile, by the *Sarazens*, who had got a Tincture of it, in their Conqueſt of *Egypt*, and brought what they knew of it from *Africa* into *Spain*, where it was *cultivated* by the greateſt Genius's, and patroniz'd by the greateſt Princes; even ſo far, that *Alphonſus*, King of *Caſtile*, made *Aſtronomy* one of his moſt ſerious Occupations, and enrich'd it with thoſe *Tables* which ſtill bear his Name. *Copernicus* re-eſtabliſh'd the antient *Pythagorean Syſtem*, and *Tycho* publiſh'd a *Catalogue* of 770 *fixed Stars*, from his own Obſervations. *Kepler*, from *Tycho's* Labours, ſoon after diſcover'd the *true Theory* of the *World*, and the *phyſical Laws* by which the Heavenly Bodies move. *Galileo* firſt introduc'd Teleſcopes into *Aſtronomy*, and by their Means diſcover'd the *Satellites* of *Jupiter*, the various *Phaſes* of *Saturn*, the *Spots* in the *Sun*, and his *Revolution* upon his Axis. *Hevelius*, from his own *Obſervations*, furniſh'd a *Catalogue* of *fixed Stars*, much more compleat than *Tycho's*. *Huygens* and *Caſſini* diſcover'd the *Satellites* of *Saturn*, and his *Ring*. And *Gaſſendus*, *Horrox*, *Bullialdus*, *Ward*, *Ricciolus*, *Gaſcoign*, &c. each contributed very conſiderably to the Improvement of *Aſtronomy*.

Sir *Iſaac Newton* firſt demonſtrated, from *phyſical Conſiderations*, the great Laws that regulate all the heavenly Motions, ſets Bounds to the *Planets* Orbs, and determines their greateſt Excurſions from the *Sun*, and their neareſt Approaches to him. He has given us a *new Theory* of the *Moon*, which accurately anſwers all her *Inequalities*, and accounts for them from the Law of Gravity and Mechaniſm. Which is as follows:

The Obſervatory of *Greenwich* is more Weſt than that of *Paris*, by 2° 19′; than that of *Uraniburgh*, 12° 51′ 30″.

Sir *Iſaac* places the following mean Motions of the *Sun* and *Moon*, from the *Vernal Equinox*, in the Meridian of *Greenwich*, *viz.*

	S.	°	′	″
Anno 1680, the laſt Day of *December*, *O. S.* the mean Motion of the Sun, Merid. is	9	20	34	46
Of the *Apogee* of the Sun	3	7	23	30
The mean Motion of the Moon	6	1	35	45
Of the *Apogee* of the Moon	8	4	28	5
Of the Aſcending Node of the Lunar Orbit	5	24	14	35
And *Anno* 1700, the laſt Day of *December*, *O. S.* the mean Motion of the Sun, Merid. is	9	20	43	50
Of the *Apogee* of the Sun	3	7	44	30
The mean Motion of the Moon	10	15	19	50
Of the Moon's *Apogee*	11	8	18	20
Of the Aſcending Node	4	27	24	20

Therefore in 20 *Julian* Years, or 7305 Days, the Motion of the Sun is	Rev.	S.	°	′	″
	20	0	0	9	4
The Motion of the Sun's *Apogee*	0	0	0	21	00
The Motion of the Moon is	247	7	13	34	5
Of the Moon's *Apogee*	2	3	3	50	15
The Motion of the Node	1	0	26	50	15

All

All the above-mention'd Motions are from the Point of the *Vernal Equinox*. But if the Motion, *in antecedentia*, of the *Equinoctial Point* be ſubtracted from them, *viz.* 16′ 40″, the following Motions will remain, with Reſpect to the *fixed Stars*, in 20 *Julian* Years, *viz.*

	Rev.	S.	°	′	″
The *Motion* of the *Sun*	19	11	29	52	24
Of the *Sun*'s *Apogee*	0	0	0	4	20
Of the *Moon*	247	4	13	17	25
Of the *Moon*'s *Apogee*	2	3	3	33	35
Of the Node of the *Moon*	1	0	27	6	55
According to this Computation, the	D.	H.	′		″
Tropical Year is	365	5	48	57	
And the *Sydereal* Year	365	6	9	14	½

Theſe *mean Motions* of the *Moon* (according to Sir *Iſaac Newton*) are ſubject to various Inequalities. 1. There are annual Equations of thoſe above-mention'd; *mean Motions* of the *Sun* and *Moon*; and of the *Apogee* and *Node* of the *Moon*. The annual Equation of the *mean Motion* of the *Sun*, depends on the Eccentricity of the Lunar Orbit round the *Sun*, which is of 16$\frac{11}{12}$ Parts of which the mean Diſtance of the Sun from the Earth is 1000; hence call'd the Equation of the *Center*; which, when the greateſt, is 1° 56′ 20″.

The greateſt annual Equation of the *Moon*, is 11′ 49″; of her *Apogee*, 20′; and of her *Node*, 9′ 30″. Theſe four annual Equations are always proportionable among themſelves; ſo if one of them be greateſt, the other three will alſo be greateſt; and if one be *diminiſh'd*, the other three are likewiſe diminiſh'd: Whence the annual Equation of the Sun's *Center* being given, the other three Equations are given likewiſe, as it appears by the Table. For if the annual Equation of the *Center* of the Sun agreeable to what Time ſoever, taken from thence, be call'd P, and makes $\frac{1}{10}$ P = Q. Q + $\frac{1}{10}$ Q = R, $\frac{1}{6}$ P = D, D + $\frac{1}{30}$ D = E, and D − $\frac{1}{60}$ D = 2 F: The annual Equation of the *Moon* anſwering to that Time, will be R, of the Lunar *Apogee* E; and of the *Node* F. Let it be obſerv'd, that if the Equation of the Sun's *Center* is to be added, the abovemention'd Equation of the *Moon* is to be ſubtracted, the Equation of the Lunar *Apogee* added, and the Equation of the *Node* ſubtracted. On the contrary, if the Equation of the Sun's *Center* is to be ſubtracted, the Equation of the *Moon* ſhall be added, that of the *Apogee* ſubtracted, and that of the *Node* added.

There is another Equation of the mean Motion of the *Moon*, (continues Sir *Iſaac*) depending on the Situation of the Lunar *Apogee* with Reſpect to the *Sun*, which is greateſt when the *Moon*'s *Apogee* is in an Octant with the *Sun*, and vaniſhes, when it arrives at the *Syzygies*, or *Quadratures*. This Equation, when greateſt, riſes to 3′ 52″, the *Sun* being then in *Perigæo*; but if the *Sun* be in *Apogæo*, it goes no further than 3′ 34″. In the other Diſtances of the Sun from the Earth, this Equation is reciprocally greateſt, as the Cube of that Diſtance. But when the Moon's *Apogee* is beyond the Octants, the ſaid Equation grows leſs; and is to the greateſt, ſuppos'd the ſame Diſtance of the Earth and Sun, as the Sines of the duple Diſtance of the Lunar *Apogee* from the *Syzygy*, or Quadrature, to the Radius. This is added to the Motion of the *Moon*, when the *Moon*'s *Apogee* paſſes from the Quadrature of the *Sun* to the *Syzygy*, and ſubtracted in the Paſſage of the *Apogee* from the *Syzygy* to the Quadrature.

There is likewiſe another Equation of the *Moon*'s Motion, depending on the Aſpect of the *Nodes* of the Lunar Orbit with the *Sun*; and is greateſt when the *Nodes* are in the Octants of the *Sun*, but vaniſhes when they call at the *Syzygies*, or at the Quadrate Aſpect. This Equation is proportional to the *Sine* of the duple Diſtance of the *Node* from the next *Syzygy*, or Quadrature; and when the greateſt, riſes to 47″. This is added to the Motion of the *Moon*, when the *Nodes* paſs from the *Syzygies* of the *Sun* to his Quadratures; and ſubtracted, in their Paſſage from the Quadratures to the *Syzygies*.

Take off, ſays again the ſame Author, the *mean Motion* of the *Moon*'s *Apogee*, equated as above, from the true Place of the *Sun*, the Remains will be the *annual Argument* of the ſaid *Apogee*.

Having form'd of theſe Principles (proceeds Sir *Iſaac*) a Table of Equations of the *Apogee* of the *Moon*, and of the Eccentricities of her Orbit, to every Degree of the annual Argument, to the Place of the *Moon*'s *Apogee*, firſt adequated, as above; let be added the Equation lately found, if the annual Argument be leſs than 90°, or greater than 180°; but if leſs than 270°, let it be ſubtracted: The Sum or Difference of the Lunar *Apogee*, equated a ſecond Time; which ſubtracted from the *Moon*'s Place, equated a third Time, there remains the *mean Anomaly* of the *Moon* anſwering to the Time given. Moreover, from this *mean Anomaly* of the *Moon*, and the Eccentricity of the Orbit, we'll have a *Proſtapheræſis*, or Equation of the *Moon*'s *Center*.

The greateſt Variation of the *Moon*, (ſays he) *viz.* that which happens when the *Moon* is in the Octants of the Sun, is almoſt reciprocally as the Cube of the Diſtance of the Sun from the Earth. Let it be taken 37′ 25″, while the Sun is in *Perigæo*; and 33′ 4″ while in *Apogæo*; and let the Difference of that Variation in the Octants be reciprocally as the Differences of the Cubes of the Diſtances of the Sun from the Earth, and from thence let a Table be made of the ſaid Variation of the *Moon* in the Sun's Octants, to every ten, ſix, or five Degrees of the mean Anomaly; and for the Variation beyond the Octants; let it be as a Radius to the Sine of the duple Diſtance of the *Moon* from the next *Syzygy*, or Quadrature. Thus the Variation above found in the Octant, to the Variation anſwering to the Aſpect given; which added to the Place of the *Moon* above found, in the firſt and third Square, (computing from the Sun) or ſubtracted from the ſame, ſhews, in the ſecond and fourth, the Place of the *Moon* fifthly equated.

Again, as the Radius is to the Sine of the Sum of the Diſtances of the *Moon* from the Sun, and of the *Apogee* of the *Moon* from the *Apogee* of the Sun, (or to the Sine of the Exceſs of that Sum above 360°); ſo is 2′ 10″ to the ſixth Equation of the Place of the *Moon*; to be ſubtracted, if the aforeſaid Sum, or the Exceſs, be leſs than a Semicircle; and added, if greater. Let alſo the Radius be to the Sine of the Diſtance of the *Moon* from the Sun, as 2′ 20″ to the ſeventh Equation; this take off, when the Light of the *Moon* increaſes; and add, when it diminiſhes; and the Place of the *Moon* will come out equated for the ſeventh Time, which is her Place in her proper Orbit. This is to be obſerv'd, that the Equation, here brought through the *mediocre* Quantity 2′ 20″, is not always of the ſame Magnitude, but is increas'd and diminiſh'd, according to the Situation of the *Moon*'s *Apogee*; for if the Lunar *Apogee* had been in Conjunction with the Sun's *Apogee*, the aforeſaid Equation is very near 54″ greater, and as much leſs, if in Oppoſition; and it *librates*, or wavers, between the great Quantity, 3′ 14″, and the leſs Quantity, 1′ 26″.

If the ſixth and ſeventh Equations be increas'd or diminiſh'd in the reciprocal *Ratio* of the *Moon*'s Diſtance from the Earth, *i. e.* in the direct *Ratio* of the horizontal *Parallax* of the *Moon*, they'll become more exact.

From the true Place of the Sun, take off the mean Motion of the Aſcending Node of the *Moon*, equated as above; what remains, will be the annual Argument of the *Node*. *Newton* reckons the horizontal *Parallax* of the *Moon*, in the *Syzygies*, at a mean Diſtance from the Earth, 57′ 30″. The horary Motion, 33′ 32″ 32‴, and the apparent Diameter 31′ 30″. But in the Quadratures, at a mean Diſtance from the Earth, he reckons the *Parallax* 56′ 40″, the horary Motion 32′ 12″ 2‴, and the apparent Diameter 31′ 3″. The

knew enough, then, of the *Motion* of the *Heavens*, (which he had all the Reaſon to believe were form'd for him, and conſequently ſhould always move in that juſt Order eſtabliſh'd among them, and neceſſary to cauſe thoſe *periodical Mutations*, which ſhould always render his tranſitory Manſion enchanted, and fortunate) to raiſe his Thoughts from the Admiration of that inimitable Piece of Workmanſhip, to the Contemplation of the divine Perfections of the great Architect. Why even ſhould we not ſuppoſe that *Adam* had by Infuſion, and from the firſt Inſtant of his Creation, what we have ſo long attempted in vain to gain by Art, a perfect Knowledge of the *Motions* of the *Heavens*, of the *Number* of the *fixed Stars*, of the *Diſtances* of the *Planets*, of their *Revolutions*, *Phaſes*, *Phænomena*, &c. and if not, had it not been a Crime in him to have attempted in the Garden the Diſcovery of what the *Almighty* had judg'd proper to hide from him? But perhaps he did not become an Aſtronomer till after he had forfeited his Innocence, and made a ſort of Divorce with his Senſes and Reaſon; *i. e.* after his Expulſion from the Garden; which I can ſcarcely believe, eſpecially when I reflect on that ſevere Puniſhment inflicted on him, by his offended Creator, *In ſudore vultus tui veſceris Panem*; In the Sweat of thy Brow ſhalt thou eat thy Bread: Which makes me ſuppoſe that he could not ſpare Time enough to make *aſtronomical Obſervations*.

Rudbeck, with more Appearance of Reaſon, compliments the *Swedes*, in his *Atlantica*, with the Invention of *Aſtronomy*, founded on the great Diverſity in the Length of the Days in that Country, which he ſuppoſes muſt naturally lead the People to conclude the *Earth* round, and that they live near one of its Extremes; and that prompted thereby to enquire further into the great Oppoſition of Seaſons, the *Swedes* ſoon diſcover'd that the *Sun* bounds its Progreſs by a certain Space in the Heavens, *&c.* which *Sentiment* would be more agreeable to Reaſon, if ſupported by hiſtorical Facts, which are not to be met with.

Porphyry would have the Origin of *Aſtronomy* traced as far as the Building of *Babel*, and inſinuates, perhaps, that *that* monſtrous Edifice was erected for an *Obſervatory*, from whence *Nimrod*, the Projector of the Work, could have eaſier peep'd into Heaven, (being himſelf of a very tall Stature) than ever *Caſſini* or *Flamſteed* did, even with the Aſſiſtance of their moſt monſtrous *Teleſcopes*. But if the *Almighty* was provok'd at their too great Curioſity, or not, the Truth is, if we believe *Moſes*, that he confounded the Underſtanding of the Aſtronomers, a Malady, which has been ſince hereditary, more or leſs, in the *Family*; though, if we believe *Porphyry*, there were found in *Babylon*, when taken by *Alexander*, *Celeſtial Obſervations* for the Space of 1903 Years, which therefore muſt have commenc'd within 115 Years of the Flood, or 15 Years of the Building of *Babel*.

Achilles Tatius, with far greater Foundation, conſiders the *Egyptians* as the firſt Inventors of *Aſtronomy*, who took Care to have their Knowledge therein tranſmitted to Poſterity, by having it engraven on Columns and Pyramids. *Laertius* informs us, that from the *Egyptians*, *Aſtronomy* paſs'd to the *Greeks*, and that *Thales Mileſius* firſt, about the *19th Olympiad*, and after him *Eudoxus* and *Pythagoras*, travell'd into *Egypt* to be inſtructed therein.

Pythagoras, after he had liv'd in a cloſe Community with the *Egyptian* Prieſts for ſeven Years, and had been initiated into their Religion, where he was let into the true Syſtem of the Univerſe; paſs'd afterward into *Greece* and *Italy*, where he taught the firſt *Elements* of that curious, though very *intricate Science*. He had made ſo conſiderable a Progreſs in it, that he went further in his Diſcoveries, than his Maſters; for he was the firſt who placed the *Sun* in the *Center* of the *Syſtem*, and made the *Earth* and *Planets* to turn round him. Suppoſing the *diurnal Motion* of the *Sun* and *fixed Stars* to proceed from the *Earth's Motion* round its own Axis, and conſequently apparent only, and not real. After *Pythagoras*, *Aſtronomy* ſunk into Neglect; moſt of the Obſervations brought from *Babylon* were loſt, and *Ptolemy* could recover but a very ſmall Number of them. However, *Philolaus* and *Ariſtarchus Samius*, with a few more of his Diſciples, continu'd to cultivate *Aſtronomy*.

It continu'd in that languiſhing State, till the *Ptolemies*, Kings of *Egypt*, declar'd themſelves its Protectors, by erecting an Academy at *Alexandria*, which produc'd ſeveral eminent Aſtronomers; and, among the reſt, *Hipparchus*, who undertook to number the *Stars*, and to leave the Heavens as an Inheritance to Poſterity. He foretold the *Eclipſes*, both of the *Sun* and *Moon*, for 600 Years; and on his *Obſervations* is founded *Ptolemy*'s Μεγαλησυνταξις.

Aſtronomy was a-freſh introduc'd into *Europe*, after ſeveral Ages Exile, by the *Sarazens*, who had got a Tincture of it, in their Conqueſt of *Egypt*, and brought what they knew of it from *Africa* into *Spain*, where it was *cultivated* by the greateſt Genius's, and patroniz'd by the greateſt Princes; even ſo far, that *Alphonſus*, King of *Caſtile*, made *Aſtronomy* one of his moſt ſerious Occupations, and enrich'd it with thoſe *Tables* which ſtill bear his Name. *Copernicus* re-eſtabliſh'd the antient *Pythagorean Syſtem*, and *Tycho* publiſh'd a *Catalogue* of 770 *fixed Stars*, from his own Obſervations. *Kepler*, from *Tycho*'s Labours, ſoon after diſcover'd the *true Theory* of the *World*, and the *phyſical Laws* by which the Heavenly Bodies move. *Galileo* firſt introduc'd Teleſcopes into *Aſtronomy*, and by their Means diſcover'd the *Satellites* of *Jupiter*, the various *Phaſes* of *Saturn*, the *Spots* in the *Sun*, and his *Revolution* upon his Axis. *Hevelius*, from his own *Obſervations*, furniſh'd a *Catalogue* of *fixed Stars*, much more compleat than *Tycho*'s. *Huygens* and *Caſſini* diſcover'd the *Satellites* of *Saturn*, and his *Ring*. And *Gaſſendus*, *Horrox*, *Bullialdus*, *Ward*, *Ricciolus*, *Gaſcoign*, &c. each contributed very conſiderably to the Improvement of *Aſtronomy*.

Sir *Iſaac Newton* firſt demonſtrated, from *phyſical Conſiderations*, the great Laws that regulate all the heavenly Motions, ſets Bounds to the *Planets* Orbs, and determines their greateſt Excurſions from the *Sun*, and their neareſt Approaches to him. He has given us a *new Theory* of the *Moon*, which accurately anſwers all her *Inequalities*, and accounts for them from the Law of Gravity and Mechaniſm. Which is as follows:

The Obſervatory of *Greenwich* is more Weſt than that of *Paris*, by 2° 19′; than that of *Uraniburgh*, 12° 51′ 30″.

Sir *Iſaac* places the following mean Motions of the *Sun* and *Moon*, from the *Vernal Equinox*, in the Meridian of *Greenwich*, *viz.*

	S.	°	′	″
Anno 1680, the laſt Day of *December*, *O. S.* the mean Motion of the Sun, Merid. is	9	20	34	46
Of the *Apogee* of the Sun	3	7	23	30
The mean Motion of the Moon	6	1	35	45
Of the *Apogee* of the Moon	8	4	28	5
Of the Aſcending Node of the Lunar Orbit	5	24	14	35
And *Anno* 1700, the laſt Day of *December*, *O. S.* the mean Motion of the Sun, Merid. is	9	20	43	50
Of the *Apogee* of the Sun	3	7	44	30
The mean Motion of the Moon	10	15	19	50
Of the Moon's *Apogee*	11	8	18	20
Of the Aſcending Node	4	27	24	20

Therefore in 20 *Julian* Years, or 7305 Days, the Motion of the	Rev.	S.	°	′	″
Sun is	20	0	0	9	4
The Motion of the Sun's *Apogee*	0	0	0	21	00
The Motion of the Moon is	247	7	13	34	5
Of the Moon's *Apogee*	2	3	3	50	15
The Motion of the Node	1	0	26	50	15

All the above-mention'd Motions are from the Point of the *Vernal Equinox*. But if the Motion, *in antecedentia*, of the *Equinoctial Point* be ſubtracted from them, *viz.* 16′ 40″, the following Motions will remain, with Reſpect to the *fixed Stars*, in 20 *Julian* Years, *viz.*

	Rev.	S.	°	′	″
The *Motion* of the *Sun*	19	11	29	52	24
Of the *Sun*'s *Apogee*	0	0	0	4	20
Of the *Moon*	247	4	13	17	25
Of the *Moon*'s *Apogee*	2	3	3	33	35
Of the Node of the *Moon*	1	0	27	6	55
According to this Computation, the	D.	H.	′	″	
Tropical Year is	365	5	48	57	
And the *Sydereal* Year	365	6	9	14½	

Theſe *mean Motions* of the *Moon* (according to Sir *Iſaac Newton*) are ſubject to various Inequalities. 1. There are annual Equations of thoſe above-mention'd; *mean Motions* of the *Sun* and *Moon*; and of the *Apogee* and *Node* of the *Moon*. The annual Equation of the *mean Motion* of the *Sun*, depends on the Eccentricity of the Lunar Orbit round the *Sun*, which is of $16\frac{11}{12}$ Parts of which the mean Diſtance of the Sun from the Earth is 1000; hence call'd the Equation of the *Center*; which, when the greateſt, is 1° 56′ 20″.

The greateſt annual Equation of the *Moon*, is 11′ 49″; of her *Apogee*, 20′; and of her *Node*, 9′ 30″. Theſe four annual Equations are always proportionable among themſelves; ſo if one of them be greateſt, the other three will alſo be greateſt; and if one be diminiſh'd, the other three are likewiſe diminiſh'd: Whence the annual Equation of the Sun's *Center* being given, the other three Equations are given likewiſe, as it appears by the Table. For if the annual Equation of the *Center* of the Sun agreeable to what Time ſoever, taken from thence, be call'd P, and makes $\frac{1}{10}$ P = Q, Q + $\frac{1}{10}$ Q = R, $\frac{1}{6}$ P = D, D + $\frac{1}{30}$ D = E, and D − $\frac{1}{60}$ D = 2 F: The annual Equation of the *Moon* anſwering to that Time, will be R, of the Lunar *Apogee* E; and of the *Node* F. Let it be obſerv'd, that if the Equation of the Sun's *Center* is to be added, the abovemention'd Equation of the *Moon* is to be ſubtracted, the Equation of the Lunar *Apogee* added, and the Equation of the *Node* ſubtracted. On the contrary, if the Equation of the Sun's *Center* is to be ſubtracted, the Equation of the *Moon* ſhall be added, that of the *Apogee* ſubtracted, and that of the *Node* added.

There is another Equation of the mean Motion of the *Moon*, (continues Sir *Iſaac*) depending on the Situation of the Lunar *Apogee* with Reſpect to the *Sun*, which is greateſt when the *Moon*'s *Apogee* is in an Octant with the *Sun*, and vaniſhes, when it arrives at the *Syzygies*, or *Quadratures*. This Equation, when greateſt, riſes to 3′ 52″, the *Sun* being then in *Perigæo*; but if the *Sun* be in *Apogæo*, it goes no further than 3′ 34″. In the other Diſtances of the Sun from the Earth, this Equation is reciprocally greateſt, as the Cube of that Diſtance. But when the Moon's *Apogee* is beyond the Octants, the ſaid Equation grows leſs; and is to the greateſt, ſuppos'd the ſame Diſtance of the Earth and Sun, as the Sines of the duple Diſtance of the Lunar *Apogee* from the *Syzygy*, or Quadrature, to the Radius. This is added to the Motion of the *Moon*, when the *Moon*'s *Apogee* paſſes from the Quadrature of the *Sun* to the *Syzygy*, and ſubtracted in the Paſſage of the *Apogee* from the *Syzygy* to the Quadrature.

There is likewiſe another Equation of the *Moon*'s Motion, depending on the Aſpect of the *Nodes* of the Lunar Orbit with the *Sun*; and is greateſt when the *Nodes* are in the Octants of the *Sun*, but vaniſhes when they call at the *Syzygies*, or at the Quadrate Aſpect. This Equation is proportional to the *Sine* of the duple Diſtance of the *Node* from the next *Syzygy*, or Quadrature; and when the greateſt, riſes to 47″. This is added to the Motion of the *Moon*, when the *Nodes* paſs from the *Syzygies* of the *Sun* to his Quadratures; and ſubtracted, in their Paſſage from the Quadratures to the *Syzygies*.

Take off, ſays again the ſame Author, the *mean Motion* of the *Moon*'s *Apogee*, equated as above, from the true Place of the *Sun*, the Remains will be the *annual Argument* of the ſaid *Apogee*.

Having form'd of theſe Principles (proceeds Sir *Iſaac*) a Table of Equations of the *Apogee* of the *Moon*, and of the Eccentricities of her Orbit, to every Degree of the annual Argument, to the Place of the *Moon*'s *Apogee*, firſt adequated, as above; let be added the Equation lately found, if the annual Argument be leſs than 90°, or greater than 180°; but if leſs than 270°, let it be ſubtracted: The Sum or Difference of the Lunar *Apogee*, equated a ſecond Time; which ſubtracted from the *Moon*'s Place, equated a third Time, there remains the *mean Anomaly* of the *Moon* anſwering to the Time given. Moreover, from this *mean Anomaly* of the *Moon*, and the Eccentricity of the Orbit, we'll have a *Proſtapheræſis*, or Equation of the *Moon*'s *Center*.

The greateſt Variation of the *Moon*, (ſays he) *viz.* that which happens when the *Moon* is in the Octants of the Sun, is almoſt reciprocally as the Cube of the Diſtance of the Sun from the Earth. Let it be taken 37′ 25″, while the Sun is in *Perigæo*; and 33′ 4″ while in *Apogæo*; and let the Difference of that Variation in the Octants be reciprocally as the Differences of the Cubes of the Diſtances of the Sun from the Earth, and from thence let a Table be made of the ſaid Variation of the *Moon* in the Sun's Octants, to every ten, ſix, or five Degrees of the mean Anomaly; and for the Variation beyond the Octants; let it be as a Radius to the Sine of the duple Diſtance of the *Moon* from the next *Syzygy*, or Quadrature. Thus the Variation above found in the Octant, to the Variation anſwering to the Aſpect given; which added to the Place of the *Moon* above found, in the firſt and third Square, (computing from the Sun) or ſubtracted from the ſame, ſhews, in the ſecond and fourth, the Place of the *Moon* fifthly equated.

Again, as the Radius is to the Sine of the Sum of the Diſtances of the *Moon* from the Sun, and of the *Apogee* of the *Moon* from the *Apogee* of the Sun, (or to the Sine of the Exceſs of that Sum above 360°); ſo is 2′ 10″ to the ſixth Equation of the Place of the *Moon*; to be ſubtracted, if the aforeſaid Sum, or the Exceſs, be leſs than a Semicircle; and added, if greater. Let alſo the Radius be to the Sine of the Diſtance of the *Moon* from the Sun, as 2′ 20″ to the ſeventh Equation; this take off, when the Light of the *Moon* increaſes; and add, when it diminiſhes; and the Place of the *Moon* will come out equated for the ſeventh Time, which is her Place in her proper Orbit. This is to be obſerv'd, that the Equation, here brought through the *mediocre* Quantity 2′ 20″, is not always of the ſame Magnitude, but is increas'd and diminiſh'd, according to the Situation of the *Moon*'s *Apogee*; for if the Lunar *Apogee* had been in Conjunction with the Sun's *Apogee*, the aforeſaid Equation is very near 54″ greater, and as much leſs, if in Oppoſition; and it *librates*, or wavers, between the great Quantity, 3′ 14″, and the leſs Quantity, 1′ 26″.

If the ſixth and ſeventh Equations be increas'd or diminiſh'd in the reciprocal *Ratio* of the *Moon*'s Diſtance from the Earth, *i. e.* in the direct *Ratio* of the horizontal *Parallax* of the *Moon*, they'll become more exact.

From the true Place of the Sun, take off the mean Motion of the Aſcending Node of the *Moon*, equated as above; what remains, will be the annual Argument of the *Node*. *Newton* reckons the horizontal *Parallax* of the *Moon*, in the *Syzygies*, at a mean Diſtance from the Earth, 57′ 30″. The horary Motion, 33′ 32″ 32‴, and the apparent Diameter 31′ 30″. But in the Quadratures, at a mean Diſtance from the Earth, he reckons the *Parallax* 56′ 40″, the horary Motion 32′ 12″ 2‴, and the apparent Diameter 31′ 3″. The

Moon's *Center* at a mean Diſtance in the Sun's Octant, he'll have diſtant from the *Center* of the Earth, as 6° $\frac{2}{9}$ of the Earth's Semidiameters. He reckons the Sun's horizontal *Parallax* 10″, and his apparent Diameter in the mean Diſtance from the Earth, 32′ 15″.

The Earth's *Atmoſphere*, in breaking and diſſipating the *Moon*'s Light, throws a Shadow, as if it was opake, at the Altitude at leaſt of 40 or 50 geographical Miles (he calls a geographick Mile the ſixtieth Part of a Degree of the great Circle on the Earth's Superficy); this Shadow falling on the *Moon*, in a Lunar *Eclipſe*, increaſes the Shadow of the Earth, and to every Mile of the Earth's *Atmoſphere* anſwers every Second in the *Moon*'s Diſk; therefore the Semidiameter of the Earth's Shadow thrown into the *Moon*'s Diſk, is to be augmented very near 50 Seconds. This is a general Idea of Sir *Iſaac Newton*'s *Theory* of the *Moon*.

Mr. *Flamſteed*, upwards of 40 Years, watch'd the Motions of the *Stars*, and has given us a great Number of curious Obſervations of the Sun, Moon, and Planets, beſides a *Catalogue* of 3000 fix'd Stars; which are more than double the Number in that of *Hevelius*.

Aſtronomy, with Reſpect to its different States, is divided into Old and New *Aſtronomy*. *Claudius Ptolemy*, who died *A. D.* 147. has given a very perfect Deſcription of the Old, or Antient *Aſtronomy*, in his Μεγαλη Συνταξις, an Epitome whereof was made, for the Learners, by *Purbachius* and *Regiomontanus*, in 1550, containing the whole Doctrine of the heavenly Motions, their Magnitudes, Eclipſes, &c.

Copernicus is conſider'd as the Inventor or Founder of the New *Aſtronomy*, in his ſix Books of the *Celeſtial Revolutions*, publiſh'd in 1566. The *Aſtronomers* of Note, who have wrote according to *Copernicus*'s Syſtem, are, *Kepler*, in his Commentaries of the Motions of *Mars*, publiſh'd in 1609. *Bullialdus*'s *Aſtronomia Philolaica*, publiſh'd in 1645. *Ward*'s *Aſtronomia Geometrica*, publiſh'd in 1656. *Wingate*'s *Aſtronomia Britannica*, publiſh'd in 1669. *Newton*'s *Aſtronomia Britannica*, publiſh'd in 1657. And *Street*'s *Aſtronomia Carolina*, in 1661.

We have, in *Ricciolus*'s *Almageſtam Novum*, publiſh'd in 1657, the ſeveral Hypotheſes of all the *Aſtronomers*, antient, as well as modern; and in *Gregory*'s *Elementa Aſtronomiæ Phyſicæ & Geometricæ*, in 1702, the whole modern *Aſtronomy*, as founded on the Diſcoveries of *Copernicus*, *Kepler*, and Sir *Iſaac Newton*.

ATHEISM.

ATHEISM, is a ſacrilegiouſly preſumptuous Doctrine, or rather blaſphematory Extravagance, invented by the Father of Falſhood, on purpoſe to perſuade Mankind to deny the Exiſtence of a ſupreme Being, and of a Providence.

There are two Sorts of *Atheiſm*, one Speculative, and the other Practical.

The ſpeculative *Atheiſm* is that founded on Principles and Theory. And the practical *Atheiſm* has for its Origin, Vice, Debauchery, Immorality, and Irreligion; which make thoſe abandon'd to it wiſh there was no God, to puniſh their Crimes, or to reward the Virtue of thoſe, who by their exemplary and religious Life confeſs his Exiſtence.

Thoſe two Sorts of *Atheiſm* have been cenſur'd in all Ages, and under all Sorts of Religions, not only as injurious to that omnipotent, ſupreme, and eternal Being, who has form'd the World of Nothing; but alſo as contrary to Reaſon, and to thoſe juſt Sentiments of Gratitude we are oblig'd to expreſs to the divine Providence, for our Exiſtence, and for the particular Care ſhe takes of our Preſervation; ſince was ſhe to forget, for a ſingle Moment, that we are the Work of her Hands, at that very Inſtant we ſhould return into our former Nothing.

Plato diſtinguiſhes three Kinds of *Atheiſts*; ſome who deny abſolutely that there are any Gods. Others who allow the Exiſtence of Gods, but maintain that they do not concern themſelves with human Affairs, and ſo deny a Providence. And others, who believe there are Gods, but think that they remit the greateſt Crimes for the ſmalleſt Supplication; though, in my Opinion, this laſt Claſs are not properly *Atheiſts*, but only a Sect of *Libertines*, who to ſilence the ſevere Reproaches of their Conſcience, againſt the Diſorders of a licentious, diſſolute, perhaps very criminal Life; and the firſt Rudiments of Religion they were inſtructed in, in their Infancy, which repreſented God as a juſt and impartial Judge, rewarding Virtue, and puniſhing Vice with the greateſt Severity, being not perhaps yet quite obliterated in their Memory, they endeavour to mitigate that Severity, and repreſent it to themſelves as extremely exaggerated by their firſt Tutors. They know that there is a God; they confeſs that he is to be their Judge, and to call them to a juſt Account for all the Actions of their Lives; but they would diveſt him, if they could, of one of his chief, or principal Attributes, Juſtice: They will offend him, and would do it with Impunity, and without his being ſenſible of the Offence.

Thoſe of the ſecond Claſs, who would perſuade us that they have the moſt high, advantageous, and perfect Idea of the *Divinity*, are not neither to be conſider'd as *Atheiſts*, and are very little different from thoſe of the laſt Claſs; for if there is any among them, it is only in the Choice they make of a different Attribute, to indulge themſelves in their Extravagancies, Diſorders, and Licentiouſneſs: For they both confeſs the Exiſtence of a God; they both acknowledge in him thoſe divine Attributes which are peculiar to a ſupreme, eternal, and incomprehenſible Being: But the one relies on his Clemency, Compaſſion, and Manſuetude; and the other on the Sublimity of his divine Apprehenſion, far above the Care of this tranſitory World. Theſe would have him entirely buried in the Contemplation of his divine Attributes, in which conſiſts his Divinity, (the inexhauſtible Source of that unalterable Felicity the Bleſſed enjoy in the celeſtial Manſions) without minding trifling Affairs, and the inſignificant Actions of Creatures infinitely beneath his Attention, who can neither advance his Glory, nor offend him: And thoſe, on the contrary, would have him mind his Creatures, ſo far, as to conſider all their Offences as Infirmities inſeparable from the vitiated Origin of human Nature; and, as ſuch, excuſe them.

Therefore there are, in Fact, no *Atheiſts*, but thoſe of the firſt Claſs; though the greateſt Part of our *Theologians* are of Opinion, that there can be no *Atheiſts*; and that thoſe who pretend to be ſuch, are only affected ones; ſince we have all within us an innate Idea of the *Divinity*, which can be prov'd, by that natural Inclination we have, as ſoon as we begin to know our ſelves, of adoring a *ſupreme Being*, under ſome Form or other. Ever ſince the *Creation*, under both Hemiſpheres, and as far as the remoteſt Climates, amidſt the ſcorching Sands of *Africa*, and the vaſt and dark Foreſts of *America*; there have been found Men, who, though diſtinguiſh'd from the Brutes but by a ſmall Glimmering of Senſe and Reaſon, and barren, and uncultivated, as their Fields; have liſten'd to the imperfect Dictates of that Reaſon, which could perſuade them that there was ſomething above their Apprehenſion, who had a Superintendency over all *created Beings*, and who kept all ſublunary Things in that Regularity, and juſt Harmony, which

which ſubſiſted among them, and, as ſuch, claim'd their Adoration. But as thoſe Ideas of a *Divinity* were too confus'd, too imperfect, and too much wrapp'd up in the Senſes, for to be rais'd to the Contemplation of the divine Object they ſeem'd to be deſign'd for; thoſe ignorant Men look'd round about them, for one, among the viſible ones, who could deſerve that religious Care: And finding the *Sun* and *Moon* the moſt incomprehenſible of all viſible Things, their *periodical Motions*, their *Radiancy*, and *Situation*, above all other *created Beings*, to be ſomething *miraculous*, and *divine*; they proſtrated themſelves before them: But then, though miſtaken in the Object, they were not in their Intentions; which prov'd that they knew there was a God, though they were ignorant where he was, and who he was.

To this Notion, or Idea of the Exiſtence of a ſupreme Being, muſt agree all thoſe, who are willing to declare freely and candidly their real Sentiments; for then they are oblig'd to confeſs that there is a ſpiritual and ſimple Subſtance, exiſtent by it ſelf, eternal, immenſe, infinite, omnipotent, all-ſeeing, all-containing, governing, and giving Motion to all Things. Had *Protagoras* and *Diagoras* (who, according to *Tullius*, *lib.* 1. *De Natur. Deorum*, were charg'd with being profeſs'd *Atheiſts*) been aſk'd, Who was he whoſe Exiſtence they denied, they muſt have anſwer'd, *God*, or a ſpiritual Subſtance, perfectly ſimple, perfectly eternal, immenſe, and infinitely perfect; which muſt be the common Notion of all rational Beings, which the *Epicureans* have attempted to obliterate in our Imaginations, by repreſenting *God* as an extended Subſtance; and, among the reſt, *Spinoſa*, an *Atheiſt* of our Time, who being born at *Amſterdam*, among the *Jews*, profeſs'd, at firſt, the *Jewiſh* Religion, and the *Chriſtian* afterwards, though both in Appearance only: At laſt, by a juſt Judgment of God, as it happens always to thoſe, who, though they know him, do not ſerve him as they ought, renounced all Sorts of Religion, infatuated with the extravagant Ideas he had form'd to himſelf, contrary to thoſe he was born with, of a ſupreme Being, he began to teach that there is nothing properly and abſolutely exiſting but Matter, and the Modification of Matter; among which are even comprehended Thoughts, abſtract and general Ideas, Compariſons, Relations, Combinations of Relations, *&c.* That God is not, as we imagine, an infinite, intelligent, happy, and perfect Being, nor any Thing but that natural Virtue, or Faculty, which is diffus'd throughout all Creatures; and though he be the Cauſe of all Things that exiſt, he is not, however, different from them. That there is but one Being, and one Nature; and that this Nature produces within it ſelf, by an immanent Act, all thoſe which we call Creatures; and that this Being is, at the ſame Time, both Agent and Patient, efficient Cauſe and Subject; but that he produces nothing of himſelf, but Modifications.

Spinoſa could not conceive either that Matter is eternal, and different from God, or that it could be produc'd from nothing, or that an infinite and free Being could have made a World ſuch as this is. He thought that a Matter which exiſts neceſſarily, and which, nevertheleſs, is void of Activity, and ſubject to the Power of another Principle, is an Object that ſtartles our Underſtanding, as there ſeems no Agreement between the three Conditions. He ſuppos'd, that a Matter created out of nothing is no leſs inconceivable, whatever Efforts we make to form an Idea of an Act of the Will, that can change what before was nothing, into real Subſtance, beſides its being contrary to that known Maxim of Philoſophers, *Ex nihilo nihil fit.* Neither could he imagine that an infinitely good, holy, free Being, who could have made his Creatures good, and happy, ſhould rather chuſe to have them wicked, and eternally miſerable; and the rather, as it ſeems difficult to reconcile the Freedom of Man with the Quality of being made out of nothing. From this he concluded, in his Treatiſe *Theologico Politicus*, that all Religions are only political Engines, calculated for the publick Good; to render the People obedient to Magiſtrates, and to make them practiſe Virtue and Morality. He endeavours to ſhew, in the ſame Treatiſe, that the *Pentateuch* is not the Work of *Moſes*; and has alſo his particular Sentiments, as to the Authors of the other Books. This Treatiſe, *Theologico Politicus*, printed at *Hambourg* in 1670, was condemn'd by a Publick Decree of the States of *Holland*, though it has ſince been ſold publickly, and even reprinted, both in *Latin* and *French*, in that Country, and lately in *Engliſh* at *London*.

Thoſe who have attempted to refute *Spinoſa*'s Doctrine, are, *Witſius*, in *Holland*; *Majus*, in *Germany*; *De la Motte*, in *England*; *Bredenbourg*, *Velthuyſius*, *De Verſe*, *Poiret*, *Wittichius*, *Lami*, *Jaquelot*, *Jens*, *Colorus*, *Jenichen*, *Budeus*, and *Fabricius*.

Therefore leaving to thoſe Authors the Care of rooting out a Doctrine ſo contrary to that innate Notion we ſhould have of the Exiſtence of a ſupreme Being; we'll proceed on the moſt convincing Proofs of that innate Idea. *Tertullian Apologet. c.* 17. proves God's Exiſtence, from this natural Teſtimony of our Soul. *Quæ licet*, ſays he, *carcere corporis preſſa, licet inſtitutionibus pravis circumſcripta, licet libidinibus & concupiſcentiis evigcrata, licet falſis diis exancillata; cum tamen reſipiſcit, ut ex crapula, ut ex ſomno, ut ex aliquâ valetudine, & ſanitatem ſuam patitur, deum nominat, hoc ſolo, quia propriè verus hic unus Deus bonus & magnus. O teſtimonium animæ naturaliter Chriſtianæ! denique pronuntians hæc, non ad Capitolium, ſed ad Cælum reſpicit; novit enim ſedem Dei vivi; ab illo & inde deſcendit: i. e.* Which although incarcerated in the Body, though vitiated in her Principles, or weaken'd by Luxury and Debauchery; though enſlav'd by falſe Divinities, when ſhe returns to perfect Underſtanding, or from a Debauch, or awaking from Sleep, or when recover'd from a Malady, or afflicted by one, names GOD, for no other Reaſon, but becauſe this true and only *God* is good and great. O Teſtimony of a Soul naturally *Chriſtian!* Laſtly, When he pronounces theſe Words, he does not turn himſelf towards the *Capitol*, but towards Heaven, which he knows to be the Seat of the living GOD, and that he came from him, and from thence.

To this, thoſe who deny this natural or innate Idea of the Divinity, object, that an Idea or Notion acquired by our Senſes is not natural, and that that Notion of a ſupreme Being is acquired with the Aſſiſtance of our Senſes is evident from St. *Paul*'s Teſtimony, *Rom. c.* i. *v.* 20. *For the inviſible Things of him from the Creation of the World are clearly ſeen, being underſtood by the Things that are made, even his eternal Power and Godhead.*

The Anſwer to this Objection is, that the viſible Things meant by the Apoſtle help us towards aſſiſting us in the Acquiſition of a Knowledge of the inviſible ones occaſionally; *i. e.* by exciting within us the innate Idea we have of a ſupreme Being, but not as the original Cauſes of that Knowledge, ſince neither our Reaſon, nor the viſible Things, could by themſelves, and without the Aſſiſtance of that Idea, repreſent to our Imagination an inviſible *God*. For if we were to acquire an Idea of God from the Perception of Things viſible, we certainly ſhould form it of the Perfections inherent in thoſe viſible Things, as from the Radiancy of the Sun and Stars, from the Heat of the Fire, the Whiteneſs of the Snow, *&c.* But it is impoſſible we could form an Idea of the Divinity of thoſe Perfections, elſe we ſhould conceive God, radiant like the Sun, hot like the Fire, white like the Snow, *&c.* which would be an Abſurdity; therefore we do not draw that Idea of God from the Perception of ſublunary Things, as from its Source or Origin, notwithſtanding what *Gaſſendi* pretends, *prim. Part. inſtitu. Logi.* c. 3. that ſuch Notion proceeds from our Senſes, or by Compoſition or Adunation of ſeveral Ideas together; or by Ampliation or Imminution;

nution; or else by Tranſlation and Accommodation.

1. It cannot be by Compoſition or Adunation of ſeveral Ideas together, like the Idea of a golden Mountain is compoſed of the ſeparated Ideas of a Mountain, and of Gold, ſince ſeveral imperfect Ideas put together cannot repreſent a Thing perfect. 2. Nor by Ampliation or Imminution of the Idea of Things ſenſible, as when we conceive a Giant from an Infant, or an Infant from a Giant; for in this only an Infant and a Giant agree, that they are both Partakers of ſome Extenſion, of which we have a natural Idea; but God is not ſuſceptible of, or rather ſubject to Extenſion, his being a ſpiritual, not a corporal Subſtance, elſe he would not be infinitely Perfect. 3. Not by Tranſlation, or Accommodation, as when from the Flight of ſome ſmall Birds we imagine the Onſet of two Armies, ſince there is no Relation between Things corporal and imperfect, and thoſe which are ſpiritual and perfect; therefore an Idea of the Divinity cannot be acquired by the ſingle Atteſtation of our Senſes.

Nether can it be further objected, that God is vulgarly repreſented under the Form of a venerable old Man, with no other Deſign, but that we ſhould acquire, with the Help of our Senſes, a Notion of his Eternity, that it is for that Reaſon *Daniel* calls him, *c.* vii. *v.* 9. *Antiquus Dierum*; for if it was ſo, he ſhould be alſo conceived as a Fire, becauſe he appeared to *Moſes* in *Flamma Ignis de Medio Rubi. Exod. c.* iii. *v.* 2. and the Holy Ghoſt, underſtood as a Column or a fiery Tongue, becauſe he has appeared in thoſe Shapes, *Matt. c.* iii. *v.* 16. and *Acts Apoſt. c.* ii. *v.* 3.

Some are of Opinion that we cannot have a Notion of the infinite Perfections of God, without ſuppoſing him free from thoſe Imperfections, which our Senſes inform us we are Subjects to; which is an Error, ſince we do not know ourſelves imperfect, but becauſe we have within us an innate Idea of Perfection, from which we are ſenſible, we have the Misfortune to deviate much. For that Reaſon we pronounce our Body an imperfect Being, with Reſpect to our Soul, which we know perfectly well to be far more perfect. But we know nothing in the whole Creation more perfect than our Soul, therefore we could not believe it imperfect, if we had not a Notion of Perfection quite different, or rather independent of our Senſes; and as we are convinced that our Soul is very far from being all Perfection, it is evident that we have an Idea of another Being, who muſt have all thoſe Perfections, we know our intellectual Subſtance is a Stranger to.

Some would be ready enough to conclude, that if this Doctrine was true, there ſhould be no *Atheiſts*; and in Fact there are none but voluntary ones; I mean thoſe, who refuſe obſtinately to conſult their innate Idea of the Divinity, or to have that Idea excited by the Contemplation of Things created and viſible. Some of thoſe, though they know God, becauſe they will not glorify him as God, are abandoned to the Extravagancy of their vitiated Imagination, ſo far as to attempt at laſt to blot out of their Imagination that innate Idea of the Divinity, and to perſuade themſelves that all that happens in this World is to be attributed to Fate and Nature. Such were the *Epicureans* of paſt Ages, and ſuch are thoſe of the preſent Times.

But however we muſt not conclude, that becauſe we have an innate Idea of the Divinity, or a diſtinct and clear Knowledge of a perfect Being, God is not above our Apprehenſion, ſince 'tis impoſſible for our intellectual Faculty to diſcover all his Perfections; though it does not reſult from thence, that we cannot have an Idea of an infinite Being, ſuch as God is repreſented to be; ſince by *Infinite* is underſtood a Thing which has no Limits, or a Thing ſupreme, to which nothing can be added, even by Thought or Imagination; but we muſt be convinced, by only conſulting our Reaſon, that we know what is to be without Limit, and what cannot be augmented by any Addition whatever; for we know very well that nothing can be added to a Being infinitely perfect, elſe he could not be infinitely perfect; we know likewiſe that neither a Body can be infinite, ſince there is no Number, let it be ever ſo great, which could not be augmented by Imagination; nor a Body ever ſo extended, whoſe Extenſion could not be protracted farther; therefore we have a clear and diſtinct Notion of the Infinite; not by a Negation of the Finite, as ſome have imagined, ſince we rather know it by ſome Diminution of the Infinite, as ſome determinate Being, or a Part of a Being, which we are obliged to take off, or abſtract from that Being (which we underſtand without Limits) before we can be capable to gain a juſt Notion of a Thing finite, therefore we muſt know the Infinite before the Finite; and not by a Negation of the Infinite.

A third Objection againſt the innate Idea of a Divinity, is that, if we had that Idea, we ſhould have a perfect Knowledge of *God*, contrary to the Sentiment of all the Theologians, and of St. *Thomas* in particular, who ſays, *prim. Part. Queſt.* 2. *Art.* 1. *Nos non ſcimus de Deo quid eſt*; *i. e.* We do not know what *God* is; and that therefore we have no Idea of *God*, or if we have any, it cannot be a natural one, but only what can reſult from what we have learned from our Parents, School-Maſters, and others.

The Anſwer to this Objection is, that the innate Idea we have of *God*, though clear and diſtinct, is nevertheleſs but an imperfect one; becauſe it contains Attributes particular to God alone, and by which he is diſtinguiſhed from all other Beings. For Example, this natural Idea don't give us an entire and perfect Notion of the Trinity of the Perſons in one Nature; nor of the Generation of the Word from the Father; nor of the Proceſſion of the Holy Ghoſt from the Father and Son, and is very deficient from the Plenitude of a Being infinitely perfect; therefore, in that Senſe we rather conceive what *God* is not, than what he is; according to St. *Auguſtin*, in *Pſalm* lxxxv. *Numb.* xii. *Deus ineffabilis eſt*, ſays he, *facilius dicimus quid non ſit quam quid ſit. Terram cogitas, non eſt hoc Deus: Mare cogitas, non eſt hoc Deus: Omnia quæ ſunt in Terrâ, Homines & Animalia, non eſt hoc Deus: Omnia quæ ſunt in Mari, quæ volant per aerem, non eſt hoc Deus: Quidquid lucet in Cælo, Stellæ, Sol, & Luna, non eſt hoc Deus: Ipſum Cælum, non eſt hoc Deus: Angelos cogita, Virtutes, Poteſtates, Archangelos, Thronos, Sedes, Dominationes, non eſt hoc Deus. Et quid eſt? Hoc ſolum potui dicere quid non ſit. i. e. God* is ineffable; it is eaſier to ſay what he is not, than what he is: You imagine the Earth, that's not God: The Sea, that's not God: All that is upon the Earth, Men and Beaſts, that's not God: All that ſwim in the Sea, or fly in the Air, that's not God: All that ſhines in the Heavens, the Stars, Sun, and the Moon, that's not God: The Heavens themſelves, that's not God: The Angels, Powers, Virtues, Archangels, Thrones, Dominations, that's not God. And what is he? I have been only capable to ſay, what he was not. Though St. *Auguſtin* could not have ſaid all thoſe Things above-mentioned, without the Aſſiſtance of a clear and diſtinct Idea of God, though an imperfect one; or as he expreſſes himſelf, *lib.* 7. *Confeſſ. c.* 17. unleſs the human Underſtanding knew in ſome Manner the immutable Good, he would by no means prefer it to the mutable one.

This innate Idea of the *Divinity*, or of a Being infinitely perfect, preſuppos'd; it is impoſſible any Body could ſeriouſly deny, or even revoke in Doubt the Exiſtence of God, by whom all we can ſee or conceive, is govern'd and adminiſter'd. But, however, if there were ſome Men ſo extravagant as to ſay, IN CORDE SUO NON EST DEUS; *in his Heart there is no God*; we muſt not abandon them to the Ridicule of their falſe Notions, but rather endeavour, as much as lay in our Power, to reclaim them, by making them ſenſible of their Error.

Of an infinite Number of Arguments, whereby the *Atheiſts* can be convinc'd of Impiety and Folly, in denying *God*'s Exiſtence, St. *Thomas*, *Prim. Part.*

sum. Theolog. quæst. 2. *art.* 3. has selected five, which he judg'd the most persuasive. The first is taken from the Motion of Bodies, employ'd by *Aristotle*, *l.* 8. *Physic.* for the same Purpose. The second from the Order of the efficient Causes. The third from a possible and necessary Being. The fourth from the different Degrees of Perfection which occur in several Things. And the fifth from the just Order and Œconomy the visible World is kept in. But as these Things have receiv'd a new Lustre in the Physical Meditations of *Des Cartes*; it is but just we should join the modern and antient Philosophy together, for the Elucidation of a Doctrine which so nearly concerns our eternal Felicity.

All the Arguments us'd on this Occasion by both antient and modern Philosophers, are metaphysical, physical, and moral; and all, *à posteriori*, or from the Effect to the Cause; not *à priori*, or from the Cause to the Effect. We'll begin with the metaphysical Arguments, as the first known, the more general, and from which all the others depend, then we'll proceed to the physical, and conclude with the moral.

Note, That we understand by METAPHYSICAL Arguments, those taken from the Consideration of the human Understanding, and its natural Ideas.

Des Cartes, Tertia Medita. Metaph. draws the first metaphysical Argument from that, the innate Notion Men have of a supreme Being cannot proceed but from God himself; since we have no other Reason to prefer Good to Evil, than because we find Good more agreeable, and to approach nearer the innate Idea we have of the greatest Perfection; which Idea cannot proceed but from God himself, not from ourselves, our Parents, nor even from the Consideration of Things visible; since neither we, our Parents, nor the Things visible are possessed of that Perfection, as they should be, if it had its Origin in them, according to this Axiom: *Quidquid est Perfectionis in Re aliquâ, id in prima, tota que illius Causa, vel formaliter, vel eminenter contineri debet.* Therefore that Idea must be from God, and consequently there is a God.

On this is founded the fourth Reason of St. *Thomas*, taken from the different Degrees of Perfection, to be met with, in different Things. For, it is universally granted, that of all Things we know, some are more, and some less perfect; for Example, we always prefer an animated or living Body, to an unanimated, or dead one, and spiritual, to corporal Substances, at least we have a higher Notion of them; but there cannot be more or less, but with Comparison to something still more perfect; for as *Boetius* observes, *de Consolat. Philosop. prof. Decim. Omne quod imperfectum esse dicitur, id Diminutione perfecti imperfectam esse videatur; quo fit ut, si in quolibet genere imperfectum quid esse videatur, in eo perfectum quoque aliquid esse necesse sit. i. e.* All that's considered as imperfect, must be imperfect, by a Diminution of the perfect; therefore if any Thing seems imperfect in any Kind of Things, there must necessarily be something perfect in it: Consequently there must be a Being infinitely perfect; *i. e.* A Being existing *per se*, or by himself, eternal, infinite, immense, in a Word, there must be a *God*; for by that Name *God* we naturally understand a Being perfect in all Things; therefore God's Existence is not to be called in Question; notwithstanding what's objected by the *Atheists*; that if there was a Being infinitely perfect, he would be also infinitely good, and therefore would not suffer any Evil should happen; since if Good suffers Evils, 'tis only to draw from it a greater Good; as St. *Augustin* judiciously observes *in Enchir. ad Laur. Num.* 3. *Deus cum summe bonus sit, nullo modo sineret mali aliquid esse in Operibus suis, nisi usque adeo esset omnipotens & bonus, ut bene faceret & de malo, i. e.* since God is infinitely good, he would by no means suffer any Evil to be in his Works, unless he was likewise omnipotent as well as good, that he might bring Good out of Evil itself.

But, say they again, God can either hinder Evil, and will not; or will and cannot; if he can and will not, he is unjust; and if he will and cannot, he is weak, and consequently is not a God. No Question but God could if he would hinder the Evils which happen among us, but then it would be necessitating our Liberty, and from that Moment we should cease being accounted free Creatures.

The second metaphysical Argument is taken by *Des Cartes*, from that an actual Existence is contained in a clear and distinct Notion of God; because, says he, a Being infinitely perfect, cannot be conceived without an actual Existence, in which consists the Perfection; therefore God must exist.

To which an *Atheist* will object, that although he conceives a Mountain must necessarily be joined with a Valley, or a Circle to be round; it don't follow from thence that the very same Mountain or Circle has any Existence. This Objection would be of some Weight, if the Parity was just between Existence, with Respect to a Being infinitely perfect, and a Valley, with Respect to a Mountain, or Rotundity, with Respect to a Circle; or if actual and necessary Existence, was as inseparable from a Mountain, or from a Circle, as it is from the Idea of a Being infinitely perfect; which is a false Supposition, since Existence is only contained as possible, in the Idea of a Thing created and imperfect, while an actual Existence is necessarily contained in the Idea of God; so that as the possible Existence cannot be separated from a clear and distinct Idea of a Thing imperfect, *v. g.* of a Circle; neither can the actual Existence be separated from the Idea of a perfect Being.

The first physical Argument used to prove God's Existence against the *Atheists*, is taken from the various Affections produced within us by occasional Causes. Since our Life is a continual Series of different Changes or Affections, either of Pleasure, or of Pain, occasioned by the Contection of Bodies. For our Mind is diverted through the Means of our Sight by the Beauty of Meadows and other Fields; agreeable or disagreeable Sounds, flatter or offend our Ears. The same might be said of the different Smells or Tastes; and the same of every Motion of all sensible Bodies, and of all that affects our Senses; but as those Bodies cannot by themselves, as proper and sufficient Causes excite within us Pleasure nor Pain, because they are inactive of themselves, and there is no Habitude between corporal Motions, and the Pleasure of Pain which affects our Minds; therefore it is necessary that the Pleasure and Pain should be the Production of some occasional Causes, by Virtue of a Law established between the human Body, and a rational Soul, which Law is general and common to all, and could not be established but by him, who contains and preserves all Things; who governs both Soul and Body; who gives Motion to this, and Sense to that, *&c.* but as a particular or private Cause cannot take Care, or provide to all Things at once, or move and govern them with such an uninterrupted Order as to make them obtain what they desire, and avoid what they fear; there must then exist that universal Author, Conservator, and Moderator of all Things, whom we call *God.*

The second physical Argument used by *Aristotle*, *lib.* 8. *Phys.* and borrowed from him by St. *Thomas*, is drawn from the Motion of Bodies, *i. e.* from their Translation from one Place to another. Since it is evident that there exists some Motion in the natural Bodies, and we should be persuaded that such Motion proceeds necessarily from God, as the first Motor; since all Bodies, big or small, are inactive of themselves; and therefore cannot move, without receiving the first Impulsion from somewhere else; they cannot be moved by a Creature let it be ever so excellent, unless that Creature receives that Force from God, and be continually assisted therein by him; consequently there must be a first Author of the Motion, from

whom each Body receives its Motion, and is continued in it. For there is nothing more abſurd, than what the *Epicureans* have imagined, that all Bodies have their Motion from themſelves, and that there exiſt active Atoms, from whoſe fortuitous or ſudden Concourſe all created Beings were produced; which Atoms, though edged in by others, are nevertheleſs in a perpetual Agitation, to diſengage themſelves. For if an Atom has a natural Motion, I aſk to which Part that Motion inclines moſt; for it cannot ſtrive in every Part? And if it is ſuppoſed to incline more to one Part than to the other; I aſk farther, why the Atom ſhould be carried to that Part rather than to the other, for a ſimple Entity, or a Corpuſcle, ſeems indifferent as to its Deſtination to any of the Parts of the World, for if once it ſtops, it can by no means be ſuppoſed capable of itſelf to reaſſume its former Motion; whence if once a Body ſtops, it is conceived to ſtay in that Condition 'till it be moved by another, which cannot be done without a firſt Motor.

Tullius, l. 2. *de Natur. Deor.* refutes admirably well this extravagant Syſtem of the *Epicureans*. *Si*, ſays he, *Mundum efficere poteſt Concurſus Atomorum, cur Porticum, cur Templum, cur Domum, cur Urbem non poteſt, quæ ſunt minus operoſa, & multo quidemfaciliora? Certé ita temeré de Mundo effutiunt, ut mihi quidem nunquam hunc admirabilem Cœli ornatum ſuſpexiſſe videantur.* If the World has been formed by the Concourſe of Atoms, what's the Reaſon why a Porch, a Temple, a Houſe, a City cannot be formed by the ſame Concourſe, ſince theſe Operations are leſs laborious, and attended with leſs Difficulties? *&c. Nemo illa*, ſays alſo *Lactantius*, lib. 3. *Divin. Inſt.* c. 17. *præter Leucippum ſomniavit, a quo Democritus eruditus Hereditatem Stultitiæ reliquit Epicuro*; Nobody has ever dreamed this but *Leucippus*, by whom *Democritus* having been educated, he left that Folly as an Inheritance to *Epicurus*.

The third phyſical Argument uſed by St. *Thomas* is deduced from the Series of the efficient Cauſes. Since, whatever Cauſes are obſerved to operate, and to produce Effects in this viſible World, as a Man to beget another Man, a Lion another Lion; they muſt be aſſiſted therein by ſome other Cauſe, ſince it is utterly impoſſible that a Man could give Exiſtence to another Man, whoſe Fabrick, Strength, and the Conſtitution of his Organs, he is entirely ignorant of; therefore thoſe Cauſes muſt depend of another in their Operations; which Cauſe operates of itſelf, or receives its Virtue of operating from another; and then there will be a Progreſs *in infinitum*, elſe it muſt fix in ſome primary Cauſe. But there can be no Progreſs *in infinitum*, at leaſt in Cauſes called *Equivocal*, *i. e.* Cauſes, which, the laſt, perhaps, excepted, are of a different State from the Effect; and obſerve ſuch a Subordination among themſelves, that the inferior cannot act without the ſuperior: Otherwiſe, if there was no primary Cauſe to communicate the firſt Impulſion, there would be no ſecond, no third, no laſt Cauſe, and conſequently, no Production of Effects, *v. gr.* a Man could not generate another Man, nor a Lion another Lion, *&c.* Therefore it muſt be fixed in a primary or firſt Cauſe of all Things, which firſt Cauſe muſt be God himſelf.

But what Need have we, ſay they, of a Proceſs *in infinitum*, ſince *Ariſtotle*, *lib.* 8. *Phyſic. c.* 1. and ſeveral other Philoſophers, are of Opinion, that the World has been from all Eternity, and conſequently, that Men have been born infinite, and other Subſtances procreated infinite; and that a Time infinite, and an infinite Motion, are elaps'd. Which Abſurdity can be refuted, by anſwering, 1. That *Ariſtotle* himſelf has confeſs'd, that there was a firſt Author of Motion, and a ſupreme Governor of this viſible World. 2. That it is utterly impoſſible to imagine, that the marvellous Machine of the Organical Body, form'd with ſo much Art and Skill, compos'd of ſo infinite a Number of delicate Organs, plac'd in ſuch beautiful and regular Order, and with ſo excellent a Symmetry, could have been produc'd by the ſingle Concourſe of Atoms, and without the Concurrence of an omnipotent Architect. But if it was even ſo, with Reſpect to the Body, was the Soul, that ſpiritual, immortal, impaſſible, unalterable Subſtance, form'd, likewiſe, by that Concourſe; are its different, excellent, and almoſt incomprehenſible Faculties, the Reſult of the different Directions, Poſitions, and Adunations of material Particles? Does its different Operations proceed from the different Motions of thoſe Particles? Do we imagine a Thing becauſe the Atoms which compoſe our imaginative Faculty have an Analogy with the Object imagin'd? And if it is ſo, why ſhould we imagine Things, which have no Exiſtence but in our Imagination, and conſequently cannot be the Effect of that Analogy; for if they have no Exiſtence, they are not form'd by a Concourſe of Atoms, and therefore there can be no reciprocal Communication betwixt them; and a Subject reſulting from ſuch a Concourſe, eſpecially if the Operations proceed from an Analogy between the Corpuſcles the Object imagin'd is form'd of, and thoſe that compoſe the imaginative Faculties. But I will ſuppoſe that the Object imagin'd is exiſtent, which is ſufficient to eſtabliſh the mutual Concourſe of the Corpuſcles; how can the imaginative Faculty repreſent to it ſelf, in an Inſtant, a thouſand, perhaps more, different Objects, ſome real, ſome chimerical; ſome exiſting, and ſome which have exiſted? Can Bodies, like the Atoms, direct themſelves, with ſuch incomprehenſible Velocity, to ſo many different Objects at the ſame Time, a Time ſo ſhort, that it is eaſily enough conceiv'd, but not defin'd, without Interruption, and Confuſion? And if they can, how can they ceaſe, all at once, their ſeveral Operations? Who can account for that Power they have to direct, or not direct themſelves, at Pleaſure; for that Faculty of directing themſelves to one Object, rather than to another? It cannot be ſaid, that it is becauſe the Object is not preſent; for we know, by a conſtant Experience, that our Imagination is not always affected by all the Objects we ſee; neither can it be pretended, that the imaginative Faculty ceaſes its Operation at the diſappearing of the Objects, which interrupt the *Analogy*; ſince we know, alſo, by Experience, that it leaves an Object, though yet preſent, to imagine another, which is, perhaps, at an immenſe Diſtance, or perhaps has no Exiſtence at all. The ſame can be ſaid of the other Faculties of our Soul, which conſequently cannot have been form'd by the Concourſe of Atoms, but muſt have a far more perfect Origin; which Origin can be no other than *God* himſelf; and therefore there is a *God*.

In the *univocal* Cauſes, *i. e.* in thoſe Cauſes which produce Effects of the ſame State with themſelves, there can be neither a Progreſs *in infinitum*; for if Man's Generations are ſaid to be infinite, and *Alexander*, *v. gr.* had been begotten by *Philip*; *Philip* by *Amyntas*; and thus *ad infinitum*; ſo that we never had a *Protoplaſtus*, or firſt Parent: Hence it would follow, that the Years elaps'd from all Eternity, and the Men generated, would be finite and infinite, which implies a Contradiction. 1. They would be finite, becauſe we cannot conceive a finite Generation of Men, to have paſs'd from an infinite Time. 2. They would be finite, becauſe their Number is continually increaſing; for the infinite cannot be augmented; otherwiſe he would have Limits, and conſequently could not be infinite: Therefore there can be admitted no Progreſs *in infinitum*, in *univocal* Cauſes, which produce Effects of the ſame Condition with themſelves; as a Man produces another Man, a Lion another Lion, *&c.* which is another convincing Proof, that, in whatever Hypotheſis, we muſt confeſs a primary Cauſe.

The firſt *moral Argument*, proving the Exiſtence of a ſupreme Being, is taken from, that all ſublunary Things tend to an End, which could not be done, were they not mov'd and govern'd by ſome ſuperior Intelligence; which Intelligence can be no other but a *God*. *Levate in excelſum oculos veſtros*, ſays the ſacred

cred Text, *Isa. c.* xl. *v.* 25. *Et videte quis creavit hæc?* Lift up your Eyes on high, and behold who has created these Things. Could the single Concourse of Atoms have form'd, by their Adunation, that vast Extent of the Heaven, and embellish'd it with those fiery and luminous Bodies, so different in their Nature and Qualities, and whose miraculous periodical Motions have caus'd the Admiration of all Ages, and have till now appear'd incomprehensible to a human Understanding. Could it be imagin'd, that a Concourse of imperceptible Corpuscles were capable to cause the Vicissitude of the Seasons, and the Difference of the Climates? Could they oblige the *Sun* to shine with his whole Radiancy under one Hemisphere, while the other is kept in Obscurity, or Darkness? Could they of themselves freeze both Men and Beasts in one Climate, and scorch them in another? And if they can, whence proceed those different Qualities? Naturally from themselves? If so, why then do they not operate all in the same Manner every where? Why don't those the *Sun* is compos'd of, for Example, which must be all of the same Nature, and must have been all directed from all Eternity, in the same Manner, tend always towards the same Place? And what could oblige them to move from one Pole to the other, and to tarry longer in one Place than in the other? If by a continual Rotation, what could cause those Vicissitudes and Inequalities in that Rotation, especially of insensible Bodies, which cannot be otherwise directed, but by their innate and proper Impulsion? Could those Bodies have a perpetual Motion of themselves, and without meeting with some Opposition from heterogeneous ones? Or could they of themselves so well avoid such Opposition, as to continue their periodical Courses, without Changes, Vicissitudes, and Alterations? Why should those which form the heavenly Bodies be more perfect in their Operations, than those which enter into the Composition of our spiritual Substance, which so often meet with so many insuperable Difficulties from extraneous Bodies; and are so often oppos'd in their Motions, and interrupted in their Operations? Have they not equally the same innate Principle of Motion? Have they not equally been directed *ab æterno?* If not, what can occasion that Difference? Perhaps the Atoms which compose our spiritual Substance, are not so perfect, nor so disengag'd from the Matter, as those the heavenly Bodies are form'd of; why, then, should they be so often more perfect in their Operations, than the heavenly Bodies? Whence should proceed those incomprehensible and marvellous Acts of our intellectual Faculties, so far above all the most extraordinary *Phænomena* of the *Heavens?* Nevertheless, those excellent Faculties are often interrupted in their Operations, since we know, by a constant Experience, that they do not always operate alike; therefore they must receive their first Impulsion from a superior Cause, which permits those Obstructions and Vicissitudes, to convince us that those different Effects have an immediate Dependance from an immutable Agent, which has within it self the Principle of all Actions, and to which all visible, as well as invisible Beings, are subordinated: And what could that be, but that omnipotent, eternal, immense, and incomprehensible Being, known to us by the Name of God? who, consequently, must have a *real Existence.*

Another Argument which can prove that those *Epicureans* have no proper Principle of Motion, nor no innate Faculty of directing themselves, is the Difference subsisting between them: For if they were *ab æterno*, and had no Principle, they should likewise have no End; an organical Body being form'd by the Concourse of Atoms, and, in all Appearance, more perfect, in the Structure and Symmetry of its Parts, than the insensible Bodies of the *Planets*, should be as little, or rather less subject to any great Changes, or Alterations, than they are, though it happens otherwise; for it is evident, that the said organical Body, perfect as it is, is always tending towards its Dissolution, that every Moment causes some Alteration in the Texture of its Parts, that the least Accident disorders the whole Machine, and often destroys its whole Symmetry; while the insensible Bodies continue longer in the same perfect State, though expos'd to a greater Number of far more dangerous Accidents; though not compos'd of two Substances equally perfect in their Nature, and equally capable to succour each other in its Distress; whence could proceed so great a Difference between the sensible and insensible Bodies, since, according to the *Epicurean Hypothesis*, they should be form'd both by the Concourse of the same Corpuscles, capable of themselves to direct themselves so to Motion, as to consult the Preservation of the Bodies they compose? It cannot be from a natural *Penchant* to *Annihilation* of the Parts of those Bodies, else they could not be eternal; therefore it must proceed from another Cause, which by an incomprehensible Order has establish'd that Difference between them.

Thus are *Atheists* to be refuted by Reason, not by Authority; since they deny all Sorts of Authority, both sacred and profane. But, however, we will not neglect to make use of those Authorities, not with the Hope of being capable of persuading, thereby, the *Atheists*, of the Extravagance and Impiety of their scandalous System, but to deter others from suffering themselves to be infected with their Dogma's.

The Apostle St. *Paul*, *Rom.* i. 20, 21, 22. assures us, that *the invisible Things of him, from the Creation of the World, are clearly seen, being understood by the Things that are made, even his eternal Power and Godhead; so that they are without Excuse: Because, that when they knew God, they glorified him not as God, neither were thankful, but became vain in their Imaginations, and their foolish Heart was darkened. Professing themselves to be wise, they became Fools.* And the Royal Prophet, Psal. xix. 1. *The Heavens declare the Glory of God, and the Firmament shews his Handy-work.* Job xii. 7. and fol. *But ask now the Beasts, and they shall teach thee; and the Fowls of the Air, and they shall tell thee: Or speak to the Earth, and it shall teach thee; and the Fishes of the Sea shall declare unto thee. Who knows not in all these, that the Hand of the Lord has wrought this?*

Lactantius has crowded his whole first Book of the *Divine Institutions*, with Passages, from Philosophers, Orators, and Poets, in Vindication of God's Existence; but we'll content our selves with the Authority of *Tully*, who, *Lib.* 2. *De Natur. Deor.* has these remarkable Words: *Si quis*, says he, *in Domum aliquam aut in Gymnasium, aut in Forum venerit; cum videat omnium rerum rationem, modum, disciplinam, non possit ea sine causa fieri judicare: Sed esse aliquem intelligat, qui præsit, & cui pareatur; multo magis in tantis motibus, tantisque vicissitudinibus multarum rerum, atque tantarum ordinibus, in quibus nihil unquam immensa & infinita vetustas mentita sit, statuat necesse est ab aliquâ mente tantos naturæ motus gubernari.* And a great deal lower, in the same Book, *Quis enim hunc hominem dixerit, qui cum tam certos Cœli motus, tam ratos astrorum ordines, tamque omnia inter se connexa & apta viderit, ne ut in his ullam inesse rationem, eâque causâ fieri dicat, quæ quanto consilio generantur, nullo consilio assequi possumus? An cum machinatione quâdam moveri aliquid vidimus, ut sphæram, ut horas, ut alia permulta, non dubitamus quin illa opera sint rationis: Cum autem impetum Cœli admirabili cum celeritate moveri, vertique videamus, constantissime conficientem vicissitudines anniversarias, cum summâ salute & conservatione rerum omnium, dubitamus quin ea non solum ratione fiant, sed etiam excellenti quadam divina ratione?* Who will call him a Man, (says *Tullius*) who, when he considers the so just, and so certain Motions of the Heavens, the beautiful and regular Order of the heavenly Bodies, and all Things subsisting with such Subordination, and so just an Œconomy among them, will have the ridiculous Presumption to deny that they all proceed from rational Causes, or to attribute to Fate those Things, which though generated and produc'd with Prudence, Judgment, and Wisdom,

dom, are, however, far above a natural Wiſdom or Apprehenſion. Can we imagine, when we ſee ſomething move with a ſurprizing Regularity and Order, as the Sphere, the Hours, &c. that they are not the Work of an intellectual Being? Can we ſuppoſe, with the leaſt Appearance of Reaſon, when we ſee the Heavens move, and turn with that admirable Celerity, conſtantly accompliſhing the annual Viciſſitudes of the Seaſons, to the Reſtoration and Preſervation of all Things, that they are not the Effects, not only of Judgment and Underſtanding, but even of a divine and ſupreme Underſtanding?

Thus ſpake a *Pagan* of the Divine Providence; theſe are the Ideas he had form'd to himſelf of the Exiſtence of a ſupreme Being; theſe are the Arguments he us'd, to confound the Folly of thoſe who had, in his Time, the phrenetical Preſumption to think that the Divinity had no Hand in the Formation of the World, and conſider'd him as an idle Spectator of all that paſſes or happens in it, without concurring, in the leaſt, in its Preſervation. Muſt we be oblig'd, then, to borrow thoſe Arguments from a Perſon who had but an imperfect Idea of the true God, and entirely bigotted to the Worſhip of the *Pagan* Divinities, to convince others, born in the Light of the *Goſpel*, of the Exiſtence of a ſupreme Being; of which, beſides their innate Idea, they are daily furniſh'd with ſo many undeniable Proofs? Muſt we call the Obſcurity of thoſe dark Times to the Aſſiſtance of the Light and Radiancy of ours? Muſt *Pagans*, to the Scandal of *Chriſtianity*, with no other Succours than their innate Idea of the Divinity, almoſt entirely ſmother'd, by the Prejudices of their Infancy, and thoſe of their Education, help that Idea to force thoſe ſtrong Obſtacles to confound the Folly of *Atheiſts*; while thoſe, born in the Boſom of the true Church, endeavour to ſilence, within themſelves, the moſt perſuaſive Dictates of that ſame Idea, in Spite of all the Advantages of their Infancy, and of their Education? Muſt they ſay, in their Heart, *Non eſt Deus*, There's no God; while that very ſame Heart contradicts what they ſay? *O tempora! O mores!*

The ſecond moral Argument, which is of a very great Efficacy againſt *Atheiſts*, is, that the new Diſcoveries, daily made in the Arts and Sciences, prove that the World is not eternal; for if the World was eternal, it would not be reaſonable to ſuppoſe that ſo many Arts and Inventions, diſcover'd daily, for the Good and Utility of a civil Society, could have been ſo long hidden. If the World was eternal, how came it to paſs that ſo many Parts of the World have been ſo long uninhabited, and ſo many others unknown to us? If the World was eternal, why have we no Hiſtory of older Date than ſix thouſand Years? Why have not the *Atheiſts* found Means, all this while, to trump up ſome, to which they could have given the Air of the greateſt Antiquity, and which could contradict the *Geneſis*, and all that *Moſes* ſays of the Creation of the World? 'Tis true, that the *Chineſe* could furniſh them with ſome Dreams or Romances of that Kind, but they are crouded with ſo many Incoherences, fantaſtical, and ridiculous Notion, that, in all Appearance, they would be aſhamed of it themſelves; and though they are not for denying the Exiſtence of a *God*, or that the World is the Work of his infinite Wiſdom, they would be left, perhaps, to defend their Opinion, with thoſe ridiculous Arguments, and falſe Authorities, which would only ſerve to expoſe the more their Folly. Though the *Chineſe* Hiſtorians could not anſwer all their Purpoſes neither; for tho' they make the World a great deal older than it is in reality; they however do not repreſent it as eternal; ſince they agree in this Point with *Moſes*, that it had a Beginning. The *Epicureans* themſelves, though they pretend that the World had no Beginning, with Reſpect to the Matter, or Atoms, are not of the ſame Sentiment as to the Compoſition of the whole; as it appears from *Lucretius*, *lib.* 1. *Rerum natura*, *v.* 325. and the following. He ſpeaks thus:

Præterea ſi nulla fuit genitalis origo
Terrarum, & Cæli, ſemperque æterna fuere:
Cur ſupra bellum Thebanum, & funera Trojæ,
Non alias alii quoque res cecinere Poetæ?
Quo tot facta virum, toties cecidere, neque uſquam
Æternis famæ monumentis inſita florent?
Verum, ut opinor, habet novitatem ſumma, recenſque
Natura eſt mundi, neque pridem exordia cepit.
Quare etiam quædam nunc artes expolientur;
Nunc etiam augeſcunt; nunc addita navigiis ſunt
Multa, modo organici melicos peperere ſonores.

The third moral Argument us'd againſt *Atheiſts*, is taken from the imminent Danger thoſe expoſe themſelves to, in denying the Exiſtence of a God, without the leaſt Appearance, or Hope, of reaping any Benefit by it: For the greateſt Profligate never commits Evil without ſome Hope to gain ſome Advantage by it; an Aſſaſſin, or Murtherer, dips his cruel and barbarous Hands in innocent Blood, either to gratify his Brutality, or ſatiate his Revenge; a Plunderer or Thief robs his Fellow Creatures, to enrich himſelf; a Voluptuary plunges himſelf in all Sorts of illicite Pleaſures, to gratify his natural Inclination to Senſuality, Luxury, and Debauchery: But an *Atheiſt* denies the Exiſtence of God, for what? Becauſe, perhaps, while he imagines that there is no *God*, he thinks that he'll be more at Liberty to give a full Carreer to his criminal Paſſions, without Fear of being puniſh'd for it; without conſidering that *that* ſole Conſideration is a Proof of the Exiſtence of *God*; for that Notion he has of a Puniſhment, muſt proceed from another he has of the Irregularity of his Conduct, with Reſpect to ſomething above the Reach of the human Laws, and that thoſe Actions which are not ſubject to a tranſitory Puniſhment, and do not come under the Cognizance of mortal Judges, are, nevertheleſs, criminal, and ſhould be puniſh'd, but by whom? Let them conſult that natural and innate Idea which excites, within them, that Fear of a Puniſhment, and it will tell them, that it will be by the very ſame *God*, whoſe Exiſtence they have the ſacrilegious Temerity to depy, contrary to its Dictates. This muſt be all the Advantage they can promiſe themſelves from their Impiety, (ſince they can be as much voluptuous, ambitious, vain, and avaricious, as they pleas'd, without the leaſt Fear of a Puniſhment from the World, ſince the World not only countenances, but even approves thoſe ſort of Vices) which in Fact is no Advantage at all; for their denying *God*'s Exiſtence, will never annihilate that Exiſtence; their denying it will never ſilence the Dictates of their Reaſon, whereby their Soul, whoſe chief Faculty ſhe is, is continually informing them that there is a *God*, ſince ſhe *is* nothing elſe, her ſelf, but a Participation of his Divinity, by that ſupernatural Irradiation which raiſes him ſo far above all the other created Beings: Therefore his Obſtinacy on that Subject, by the continual Conflict between the ſuperior Faculty of his Soul, and his vitiated Imagination, is rather a Supplice and a Torment to him, than any real Advantage; for as often as he denies *God*'s Exiſtence, by his Words, or by his Actions, he hears as often an irreproachable Witneſs within himſelf, who contradicts what he ſays, and reproaches him with his Folly. While, on the contrary, thoſe who admit or confeſs the Exiſtence of a *God*, can be always at Peace with themſelves, for that ſole Belief will keep them fearful of his juſt Judgment, and render them cautious of offending him, and let him *exiſt*, or *not exiſt*, they have nothing to fear; and for if they live according to the Sentiments which the Notion of that Exiſtence muſt inſpire them with, they are ſure to find him, after their Death, favourable to them; and if he do not exiſt, they'll die as ſecure, and with the agreeable Satisfaction of having liv'd as they ſhould. Therefore there's no Riſque for thoſe who believe the Exiſtence of *God*, while thoſe who deny it have every Thing to fear; ſince, if he exiſt, they are ſure to meet with a juſt Judge, who will puniſh them

them both for their ſacrilegious Temerity and their Crime; and if not, they muſt die with an extreme Regret, of quitting a Life, they had made their Idol, and with the Reproaches of having lived, as though they were never to die. But I go too far, and I do not perceive that theſe Suppoſitions are falſe; for the Exiſtence of this viſible World, nor our proper Exiſtence, of which we are ſo ſenſible, are ſo certain, as God's Exiſtence; ſince our Exiſtence, and the Exiſtence of this World depend entirely on his; for had he never exiſted, we had never been; and was he to ceaſe exiſting, or even to forget for a Moment that we exiſt, all this viſible World would, at that very Inſtant, return into its former nothing.

The *Atheiſts* know all this as well as thoſe who confeſs that Exiſtence, which is plainly ſeen at their Death, for very few of them have continued in their affected Obſtinacy to the laſt Moment; and thoſe *Eſprits forts*, as they are pleaſed to call themſelves, are far more frighted at the Approaches of Death, and ſhew more Puſillanimity and Cowardice then, than thoſe whom they have reproached with it, while in Health. *God* then appears to them diveſted of all his other Attributes, but of his Severity and Juſtice, and their innate Idea of his Exiſtence, whoſe Dictates are no longer ſilenced by the Tumult of their Paſſions, awakened by the violent Paroxiſms of a dangerous Diſtemper, come to paint to their frighted Imagination, that formidable Preſence in the moſt lively Colours: They confeſs then, what they had ſo long and ſo obſtinately denied, but often too late. What Pity, that what at another Time could have ſerved towards their Juſtification, muſt be, then, the Subject of their Condemnation! What deplorable Neceſſity, to be forced to confeſs the Exiſtence of *God*, when we have moſt Reaſon to wiſh he ſhould not exiſt, and when we have put ourſelves out of Power of wiſhing otherwiſe!

I'll give here an Inſtance of the Dilemma's an *Atheiſt* is in at that critical Moment. *Toland*, one of the moſt famous *Atheiſts* of the Age, who had found the Secret, under the Reign of the late Queen *Anne* of Glorious Memory, to debauch the Principles of ſeveral Young Perſons of the firſt Rank, and to poiſon them with the Venom of his impious Doctrine, for which he was baniſhed the Kingdom, having found Means, by the Credit of ſome of his moſt potent Proſelytes, to return into it again, though he perſiſted ſtill, in all Appearance, in the ſame criminal and ſacrilegious Sentiments, and continued his dangerous Leſſons, fell at laſt ſo dangerouſly ill, that his Life was deſpaired of, and had already received his laſt Paſſport, from his Phyſicians, for another World; conſidering that Affectation and Diſguiſe, which had ſo long ſupplied his Extravagancy, with Profuſion, could be no longer of Service to him, and that he was a-going to be overtaken by that ſame eternal Being, whoſe Exiſtence he had ſo long affected to deny, tho' in Fact he had always been convinced of it, ſent for a *Roman Catholick Prieſt*, (for *Toland* was born in that Religion,) to whom he confeſſed all the Enormities of his paſt Life, and in particular of his having infected with *Atheiſm*, a vaſt Number of Perſons of both Sexes. The Prieſt, who knew that *non remittitur peccatum donec reſtituatur ablatum*, and was not one of thoſe indulgent Confeſſors, who render the Road to Heaven very large, ſpacious, and eaſy, told *Toland*, that he could not abſolve him, unleſs, beſides a ſincere and unfeigned Repentance, he recanted of his paſt Errors, before his Proſelytes, that thereby they might be convinced, that himſelf knew, and acknowledged that the Doctrine he had taught them was falſe and criminal; and be perſuaded in their Turn to condemn it as ſuch. *Toland*, through Fear of God's Judgments, conſented eaſily to this Abjuration, and made it in Preſence of the moſt conſiderable and moſt obſtinate of his Proſelytes, who had been ſent for, for that Purpoſe. But, however, *Toland*, contrary to Expectation, recovered from this Indiſpoſition; and inſtead of continuing in the Chriſtian Diſpoſitions the Prieſt had inſpired him with, returned to his Vomit, and began to dogmatiſe with as much Phrenzy as ever. But he had loſt his Credit with his Proſelytes, who, almoſt, all deſerted him, in the Opinion that there was no truſting a Man who was ſo inconſtant in his Principles, and who wanted Courage and Intrepidity (as they expreſſed it) when it was moſt wanted; therefore *Toland*, to whom, at firſt, his Doctrine had procured a Coach and ſix, and every Thing agreeable to that Equipage; found himſelf reduced, at laſt, to almoſt wanting the Neceſſaries of Life; to convince his Proſelytes that he was ſincere, he wrote then ſeveral Books in Defence of his Doctrine, but all to very little or no Effect, as to the Recovery of his priſtine Splendor. Soon after thoſe vain Efforts to regain his former atheiſtical Reputation, *Toland* fell ſick again, of the Malady he died. At the Approaches of Death, feeling very quick Remorſes of his paſt Crimes, he ſent for the late Dr. *Clark*, Rector of St. *James*'s Pariſh, thinking, perhaps, that the Doctor would not deal ſo hard with him as the Prieſt had done; in which he found himſelf not entirely miſtaken, for in Fact he uſed him in a very Gentleman-like Manner, and removed with a great deal of Dexterity, all the ſtumbling Blocks *Toland* had himſelf placed in the Road to Heaven; but however, that of all his Crimes which appeared to him the moſt enormous, and which he ſuſpected *God* would be leſs inclinable to forgive, was a certain Book he had wrote in Defence of *Atheiſm*, and was a going to leave behind him, which he was afraid would produce very dangerous Effects, and make very ſtrong Impreſſions on the Mind of thoſe, who ſhould have the Imprudence or Temerity to read it; and could not help expreſſing to Dr. *Clark* his mortal Uneaſineſs on that Subject; the Doctor, in order to compoſe his diſtracted Mind, with a ſcornful Smile, adviſed him not to let that hinder him from dying in Peace, for that Book he mentioned was ſo ill wrote, that few People of any Underſtanding would have the Patience to read it throughout; and thoſe that would, would rather laugh at it than mind it. *Toland* was ſo provoked at the Doctor's deſpiſing thus his Work, that making a laſt Effort, he upbraided him with Stupidity and Ignorance, abandoned himſelf to all other Sort of Invectives againſt the good Parſon, told him that that very Book was better wrote than ever were any of his, and that the better to convince him of it, he was determined to die as he had lived, a profeſſed *Atheiſt*, as he did few Hours after.

Daniel De Foe, a Man of a rare Genius, and of excellent natural Parts, (to diſtinguiſh himſelf from the Vulgar, whom all thoſe who affect a Superiority of Genius, imagine to be led by the Noſe, by the Clergy, and attribute to his Ignorance and Stupidity, thoſe Notions of the Divinity, that Hope of a Reward, and that Fear of God's Judgments he appears to believe) affected alſo a certain Air of *Atheiſm*, and had even gained a conſiderable Number of Proſelytes: But following the Example of *Toland*, while he was ill, and one of them, who was come to viſit him during his Illneſs, finding him in a praying Poſture, reproached him with Puſillanimity and Cowardice. Ah! *B——e tu as Peure*, ſaid he, though I have not heard that ſuch Reproaches altered *De Foe*'s penitent Sentiments, and I have ſome very good Reaſon to believe that he died really penitent.

The only *Atheiſt* I have heard of, who died in his Obſtinacy, was *Rablais*; for while he was on his Death-bed, the Cardinal *De Berulle*, his Patron, having ſent one of his Servants to inquire how he did, *Rablais* anſwered him in the following bad, and ridiculous Rhimes.

Vas ten dire a ton Maitre
Que je vais voire un grand Peuteſtre;
Toi tu ne ſeras jamais q'une Beſte;
Tire le rideau la Farce eſt Joüee.

For my Part, I am of Opinion, that the ſole Inſtinct (if I may uſe that Expreſſion) of lifting up our Hands and Eyes to Heaven, in our greateſt Diſtreſſes, and Afflictions, as to a Place of Refuge for the Unfortunate, is ſufficient to confound the Impiety and Folly of *Atheiſm*. How often *Atheiſts* themſelves have pronounc'd the Name of *God*, as a *motus primo primus*, and without Reflexion, in a firſt Surprize of ſome imminent Danger, or by a ſort of Exclamation, as if Nature it ſelf ſhould ſpeak on ſuch Occaſions, and would force the Tongue to confeſs her divine Author and Protector?

Therefore *Atheiſts* are to be conſider'd as the greateſt Fools of the whole *Creation*, and their Condition to be pitied, when, notwithſtanding the moſt perſuaſive Arguments us'd againſt them, they perſiſt obſtinately in their Error: Nay, their ſole Reaſon ſuffices, ſays *Arvernus* and *Blaſius Paſcalis*, to make them renounce it.

There is a *ſupreme Being*, the ſame who has form'd this vaſt Univerſe of Nothing; the ſame who has created the firſt Matter, and divided it into ſeveral Elements; the ſame who has adorn'd the Firmament with ſo great a Number of fiery Orbs, placed them at a due Diſtance from each other, and inſpir'd them with the firſt Principle of Motion, thereby to enable them to perform their periodical Courſes with that juſt Order and Œconomy we admire, without being capable, yet, to conceive it. The ſame who has fix'd the *Sun* as a Center, or Source of Light, from which the other *Planets* borrow their Radiancy, the Earth its Warmth, and the whole Nature its chief Nouriſhment. The ſame who has form'd Man of the Scum of the Earth, that the Remembrance of his mean Origin may hinder him from abandoning himſelf to thoſe Sentiments of Vanity and Preſumption which the ſuperior Part of himſelf, his Soul, whereby he deſign'd to diſtinguiſh him from all the reſt of the created Beings, could chance to inſpire him with. The ſame who makes, when he pleaſes, the Thunder roar, and the Ocean foam; and who commands the Winds and the Tempeſts. The ſame who puniſhes the Guilty, protects and rewards the Innocent. The ſame by whom Kings reign, and Sovereigns adminiſter Juſtice. Thoſe Sovereigns who are his lively Image and Repreſentation here on Earth, who ſhould be alſo the ſacred Depoſitories of his ſupreme Wiſdom, and the faithful Interpreters of his divine Oracles. Thoſe Princes who by their Piety and Religion ſhould perſuade their Subjects, even the moſt inclinable to *Atheiſm*, that they are fully convinc'd of the Exiſtence of a ſupreme Being; who ſhould conſider as the greateſt Affront offer'd to the Throne, to have their Religion ſuſpected, or to be reproach'd of having none but their own Intereſt, or as far as it can flatter their ambitious Views; and be ſo humble, as to conſider themſelves but as ſo many Atoms in the Preſence of the King of Kings; for if Princes themſelves, by their Conduct, deny tacitly the Exiſtence of *God*, what can be expected from their Subjects, who, eſpecially in religious Matters, ſtrive to form their Belief on that of their Sovereign?

BAKING.

BAKING, is the Art of preparing Bread, or of reducing Meal, of any Kind, whether ſimple, or compound, into Bread.

The Forms of *Baking* have been various in all Ages; almoſt each different Nation has its different Manner of making Bread. In former Ages, according to the Holy Writ, the Art of *Baking* was very ſimple, and not attended with much Formality. In thoſe golden Days of Frugality and Temperance, *Baking* was not an Art practis'd by a certain Set of People, but every Family was its own *Baker*. Some Meal, mix'd together with ſome Water, without Leaven, and *bak'd* on the Earth, before the Fire, or under the hot Embers, was the ſole Bread made uſe of by the firſt Fathers of the human Race; which ſimple Form continu'd for ſeveral Ages afterwards. And when Mankind began to refine their Taſte, or when they wanted to regale themſelves, or their Gueſts, they us'd to mix their Meal with Oil, inſtead of Water; continuing ſtill to *bake* it at their own Fires: Till, in Proceſs of Time, Mankind, forgetting their former Simplicity, and Luxury prevailing among them, this Art, as well as all others ſubſervient to that Paſſion, acquir'd daily new Perfections; and the Art of *Baking* becoming too laborious, it was expell'd from private Families, eſpecially from thoſe who were above taking Care, themſelves, of their Health, and confin'd to a Set of Men, appointed for that Purpoſe; who, to render themſelves neceſſary to the civil Society, deviated from the primitive Simplicity, and invented a new Form of *Baking*, attended with ſo much Trouble and Difficulties, as to render it entirely impracticable to the Rich; and ſo chargeable and expenſive, as to force the poorer Sort of People to deſiſt from it.

Bread was no longer *bak'd* under the hot Embers, but Ovens were built, at a great Expence, appropriated at firſt to that particular Uſe only, which could not be heated without a daily additional Charge; which rais'd, at once, Bread to five or ſix Times its intrinſick Value; and leſt the exorbitant Price it was rated at ſhould oblige Families to make it once again, a Piece of Houſewifery to *bake* at Home; the *Bakers* applied themſelves entirely to change that inſipid Taſte Bread muſt have had at firſt, into a new one, which could excite the Appetite, which has continu'd ſince; but could not be ſo perfect at firſt as we have it at preſent.

The Forms of *Baking*, among the *Europeans*, is reduc'd to two; the one for *unleavened*, the other for *leavened Bread*; though very few, the *Jews* excepted, uſe at preſent *unleavened Bread*, as being too inſipid, and even thoſe but in the Time of their *Paſſover*, or of ſome other particular Feaſt. The *Roman Catholicks* us'd alſo *unleavened Bread* in the Adminiſtration of the *Euchariſt*, which Bread is made of the fineſt Flour mix'd with Water only, without any other Addition whatever. When this Mixture is brought to the Conſiſtence of Batter, they have a Sort of Inſtrument which they call *un fere*, or Iron, made in the Form of that Wafers are made with, ingraven within one of the Sides with ſome Repreſentation of the *Paſſion* of *Chriſt* (commonly his *Crucifixion*). This Iron is heated firſt, over a clear Fire, and afterwards rubbed over with Tallow, to hinder the Bread, or Wafer, from ſticking to it; and then they pour'd over the Side, which is not ingrav'd, a Spoonful of the Batter, ſhutting immediately the Iron cloſe upon it, whereby, the Batter is ſpread all over it, putting the Iron over the Fire, turning it on both Sides, to *bake* the Bread, which is done in an Inſtant; then take that off, and put on another, and thus continue till the whole Operation is over.

The other Manner of *baking unleavened Bread*, is call'd *Manchet-baking*; which is done in this Manner: The Meal, ground and bolted, is put into a Trough, and being open'd in the Middle, to a Buſhel is put about three Pints of warm Ale, with Barm, and Salt, to ſeaſon it: This is kneaded together with the Hands through the Beak, or for Want whereof with the Feet

Feet through a Cloth; after having lain an Hour to ſwell, it is molded into Manchets, which ſcorch'd in the Middle, and prick'd a-top to give Room to riſe, are *bak'd* in the Oven by a gentle Fire.

The other Form of *Baking*, call'd *Cheat-bread Baking*, is moſt commonly us'd throughout all *Europe*; and although follow'd indifferently by all Nations, they notwithſtanding do not all make Bread of the ſame *Goodneſs*. The *French* are noted for making excellent Bread, and are thought to ſurpaſs all other Nations in that Art; though it is not of an equal Goodneſs throughout the whole Kingdom. The *Mitrons de Goneſs*, a little Village near *Paris*, carry the Palm there; and the Bread of *Goneſs* is eſteem'd the beſt in *France*. For my Part, I find very little Difference betwixt it and the *Engliſh* Bread; and I ſuppoſe it to be made in the ſame Manner. It is very cloſe, like it, and is ſomewhat lighter; but, on the other Side, it has this other Imperfection, which, in my Opinion, is a very great one, it wants Salt, and muſt be eaten new; elſe, when ſtale, it has no Taſte. The Reputation in this, like in all other Things, is of a very great Advantage to ſet off the Merchandiſe; and I ſuppoſe that the only Reaſon why the *Bakers* of *Goneſs* have gain'd the Vogue, is, that when they began to flouriſh, the Art of *Baking* was not come yet to that Perfection it has been brought to ſince. The ſole Advantage this Bread has over others, is, that it is made of the beſt Meal, extraordinarily well work'd, and as well *bak'd*, neither too little, nor too much.

They have two other Sorts of Bread at *Paris*, one call'd *le Pain de Chapitre*, which is a very light Bread, and, in my Opinion, a great deal better taſted than that of *Goneſs*; it don't grow ſtale ſo ſoon, is not ſo cloſe, but, on the contrary, is full of Eyes, (as they term it) and *bak'd* to Perfection. It is call'd *Pain de Chapitre*, becauſe, it being the Cuſtom of the *Chapitres*, or Communities of Prebends, of the ſeveral Cathedrals, and Collegiate Churches of *Paris*, but more eſpecially of the Metropolitan Church of *our Lady*, to have Bread diſtributed, every Day, to the inferior Clergy, Choriſters, *&c.* call'd *Le bas Chœure*, of their reſpective Churches; there are *Bakers* appointed for that Purpoſe, who furniſh them with this excellent Bread, with the Deſign, perhaps, they ſhould eat more of it.

The third Sort of Bread at *Paris*, is call'd *Pain de Meſnage*, or houſhold Bread, which is alſo very good; but all theſe Sorts of Bread are without Salt, on account, perhaps, of the *Gabelle*, which renders it a very dear Commodity among them. Even the pooreſt Sort of People eat this Sort of Bread, which is the ſame with our houſhold.

In the other Provinces of the Kingdom their Bread differs in Goodneſs, as the Soil is more or leſs fertile in Corn. In thoſe where Vineyards are plenty, or in the *Payes Vignobles*, as *Champaigne*, *Burgundy*, &c. the Bread is but indifferent, and very bad among the pooreſt Sort of People; and in the mountainous Provinces, as *Auvergne*, they make Bread of Oats, which though very white, is nevertheleſs very diſagreeable, ſour, and gritty. They even make it ſometimes, eſpecially in Years of Scarcity, of Cheſnuts, which cannot be a very pleaſant Bread. In *Normandy*, and *Britanny*, they have three Sorts of Bread: The finer, which is made of Wheat; the ſecond, of a Mixture of Wheat, Rye, and Barley, call'd *Meſlin*, which makes a very pleaſant and wholſome Bread, when the Barley is not predominant; for then it is too harſh, and heavy: This Sort of Bread keeps long moiſt and new. The third Sort is all made of Barley, and is very black and heavy; though the Country People eat ſeldom any other, and are nevertheleſs very healthy and ſtrong. They make ſometimes Loaves of a whole Buſhel of Flour, which weighs ſixty Pounds; ſo that they very ſeldom eat new Bread. This cannot be attributed to the Sterility of the Soil, ſince thoſe two Provinces abound in *Corn*; for when there is a Scarcity, the Buſhel of Wheat, which weighs ſixty Pounds, is ſeldom ſold for more than ſix *Livres*, which is not ſix Shillings of our Money; and in plentiful Years it ſeldom exceeds Half a Crown, or three Shillings, of our Money, the other Sorts of Corn in Proportion: But the Country People chuſe to ſell their beſt, to pay their Landlord; and keep the worſt for their Uſe.

The Houſewife is the *Baker* of the whole Family. Some have Ovens of their own, ſome not, and even ſome cannot have Ovens; for in ſome Provinces, as in *Britanny*, to build an Oven is a Lord's Right, *Le Droit du Seigneur*, (as they call it) who thereby becomes the *Baker*, not of his Tenants only, but likewiſe of all thoſe who relieve from him; who are all oblig'd to reſort to what they call the *four Banale*, *i. e.* the publick Oven; paying a certain Duty for the *baking* of their Bread. Thoſe Ovens are farm'd like a Piece of Land. Some of them are ſo large, as to contain 150, and 200 Buſhels of Bread; and thoſe who keep them have no other Occupation, though they all live very well, ſome of them acquiring often thereby a tolerable Fortune.

In *Savoy*, *Piedmont*, and other Parts of *Italy*, they *bake* but very indifferent Bread. In *Piedmont*, beſides the common Bread, they have another Sort, which they call *Croket*, or *Croquete*. It is a Sort of unleavened Bread, made in the Shape of a Stick, of about ten or twelve Inches long, and about two in Circumference. It is kneaded in the ſame Manner as the Manchet Bread, and *baked* with a pretty fierce Fire, which makes it to be almoſt all Cruſt; to render it more agreeable to the Eye, they give it a Glaze with the Yolk of an Egg. At all the Publick Houſes, eſpecially at *Turin*, one is ſerv'd, every Meal, with one of theſe *Croquets*, together with other common Bread.

The common Bread *Baking* is perform'd thus: The Meal being in the Trough, ſome Leaven (ſav'd from a former Batch fill'd with Salt laid up to ſour, and at length diſſolv'd in warm Water) is ſtrain'd through a Cloth into a Hole made in the Middle of the Heap, and work'd with ſome of the Flour to a moderate Conſiſtence: This is cover'd up with Meal, where it lies all Night, and in the Morning the whole Heap is ſtirr'd, and mix'd together with a little warm Water, Barm, and Salt, by which it is ſeaſon'd, ſtiffen'd, and brought to an even Leaven; it is then kneaded, or trodden, molded, and *bak'd*.

In the kneading of the Maſs, it muſt be obſerv'd, that it is not work'd too long, elſe it would render the Bread heavy, and hinder it to riſe in the Oven; neither is it to be work'd in too great a Hurry, for then the Mixture proving imperfect, would fill the Bread with Lumps of Flour, render it harſh, and of an indifferent Taſte; Part of it being leavened, and the other unleavened; which to avoid, the Water muſt be pour'd by Degrees, and the Maſs work'd by Degrees; waiting to pour no more Water till the firſt pour'd, being ſo incorporated with the Maſs, by the working of it, till it has brought it to a due Conſiſtence, neither too hard, nor too ſoft; and then pour more Water upon that Maſs already work'd, and then the Workman approaches, with his Hand, new Flour, near that Maſs, all ready work'd, incorporating both together, and ſo on, till the End of the Operation. The Water muſt be neither too hot, nor too cold; for if too hot, it renders the Fermentation through the whole Maſs too great, and cauſes a diſagreeable Sourneſs in the Bread; if too cold, it hinders the Fermentation, which renders the Bread heavy, and gives it a ſweet, unpalatable Taſte. In Winter, the Leaven is always prepar'd in a warm Place, elſe it would have little or no Effect; and the Maſs, after it has been kneaded, is kept longer before it is put into the Oven, than in the Summer; in order to give Time to the Leaven to ferment through the whole Maſs.

There is an Art in heating the Oven for the *baking* of Bread; for if it is too hot, it hinders the Bread from riſing, and makes it almoſt all Cruſt; if too cold, inſtead of evaporating the whole Humidity, it

keeps

keeps the greateſt Part of it within the Maſs, and renders the Bread heavy, and diſagreeable: Therefore a gradual Heat is beſt; for then the Bread riſing and *baking* by Degrees, acquires a due Conſiſtence, and a ſavoury Taſte.

It muſt be obſerv'd, alſo, that the Leaven, arriv'd at an extraordinary Sourneſs, is not to be us'd, not even in the ſmalleſt Quantity; for it would communicate a very diſagreeable Taſte to the whole.

BISKET, which is a Sort of Bread, for the Service of the Sea, is made in the ſame Manner as other Bread, with this ſingle Difference, that it paſſes the Oven twice. The firſt Time it is *bak'd* to the Conſiſtence of common Bread, and kept till it has ſweated all its Humidity, and then put into the Oven again, to dry it quite; otherwiſe it would be ſubject to grow mouldy, and ſour. For long Voyages, they bake it four Times, and prepare it ſix Months before the Embarkation. The Word *Biſket* comes from the *Latin bis*, and the *French cuit*, *coctus*, *q.d.* twice *bak'd*.

There are but too often unpardonable Cheats committed in the Preparation of *Sea-Biſket*, which ſhould be puniſh'd with the greateſt Severity: For it happens, but too often, that the Undertakers have it made, but with ſtinking and damag'd Flour, which renders the *Biſket*, already unpalatable enough of it ſelf, nauſeous, and very unwholſome. There's ſcarce any Barbarity comparable to this; for it is in ſome Manner poiſoning, with a premeditated Deſign, thoſe brave Fellows, who expoſe their Lives, in more than one Manner, to ſave ours, and who may very juſtly be conſider'd as the Bulwarks of the Kingdom. What! do they feaſt ſo ſplendidly on Board, as to be able to bear the Inconvenience of black and ſtinking Bread? Or rather, is not Bread their chief Food and Support? For, except one Meal of ſalt Meat a Day, are they not obliged to feed on Bread the reſt of the Time? Which Bread has often as much Taſte as a Brickbat, and is as eaſy of Digeſtion. It is ſurprizing that *England*, which abounds with all Sorts of the beſt Corn, and with Wheat in particular, provides her Fleet with ſuch indifferent Bread; the *French* are a great deal more careful of the Lives and Health of their Sailors, and their *Sea-Biſket* is far preferable to ours. The *Engliſh* Sailors, though the beſt in the whole World, and as ſuch ſhould be better us'd, eat, to my certain Knowledge, ſome Bread worſe than that condemn'd as *machemoure* on Board the *French* Men of War, and as ſuch given to the Poultry, Hogs, *&c.* This Miſmanagement deſerves the Attention of thoſe who have the Inſpection of thoſe Affairs, and ſhould be carefully examin'd into.

The different Sorts of Bread, above-mentioned, are for common Uſe. The other Sorts, as what they call at *Paris*, *Pain De Montou*, mixed with Milk inſtead of Water, Ginger-bread in *French*, *Pain d'eſpices*, Cakes, *&c.* are only to pleaſe the Palate.

Their *Twelfth-Cakes* in moſt of the Provinces of *France* are made by the common Bakers, with Flour, Milk, Butter, Eggs, and Sugar, in the ſame Manner they make other Bread, with this Difference, that there is no Leaven in it. They make a Hole in the Heap, which is always of the fineſt Flour, in which they put as much Butter, Eggs, and Sugar, as they think fit, for there is no other Quantity fixed for thoſe Ingredients than the Fancy of the Perſon who makes it; theſe they mix together with the Flour, with Milk, adding to it two or three Glaſſes of Sack, according to the Quantity of the Maſs, which being made up, is left in a warm Place, to ferment for the Space of two or three Hours, and afterwards is molded into what Form they pleaſe, but the moſt common is flat and round, as commonly all Cakes are made. *Bakers* preſent, at the *New-year* or *Twelfth-days*, their beſt Cuſtomers with one of thoſe Cakes.

GINGER BREAD, is a rich Sort of Bread, the Flavour and Taſte whereof are heightened and improved with Spices, and particularly *Ginger*, whence the Name. There are various Forms and Preparations of *Ginger-bread*: We ſhall content ourſelves with the following one, which is well recommended. Into a Pound of Almond grate a Penny White-Loaf, and beat them together; to the Mixture add an Ounce of *Ginger*, ſcraped fine, and Anniſeed and Liquorice in Powder, of each a Quarter of an Ounce: Pour in two or three Spoonfuls of Roſe-water, and make the whole into a Paſte, with half a Pound of Sugar; mould and roll it, print it and dry it in a Stove.

Others make it with Treacle, Citron, Lemon, and Orange-Peel, candied Ginger, Coriander and Carraway-Seed, mixed up with as much Flour, as will make it into a Paſte. The beſt *French Ginger-Bread*, called by them *Le Pain d'Eſpice de Reims*, becauſe invented in that Place, is made according to the firſt Direction, except they leave out the Liquorice, and add to it all the beſt Ingredients of the ſecond Preparation, as the Lemon, Citron, and Orange-Peel; Roſe-water, Coriander and Carraway Seed; but very little Ginger, and no Aniſeed.

In all the other Parts of the World they have little or no Notion of Baking, except in thoſe Parts where the *Europeans* have ſettled, and where they are numerous; every where elſe they follow yet the primitive Simplicity of baking their Bread under the Embers; the greateſt Part of the Eaſtern and Weſtern Nations having not even the leaſt Notion of Bread. Eſpecially thoſe who dry their Meat by the *Sun*, and eat it without any other Cookery, as moſt of the *Tartars*. In the *Weſt-Indies*, and on the Coaſt of *Brazil*, ſome *Indian* Nations make Bread of a Sort of Root, they call *Caſſave*, or *Caſſabre*, which is a Sort of Poiſon of itſelf, and before its Preparation; which is done in this Manner, they pound the Root, to extract all its Juice, in which conſiſts all its Malignity; they afterwards dry it in the *Sun*, ſo that it may eaſily be reduced into a Sort of *Farina*, or Flour, which they mix with Water, and mould it into the Form of a large Pancake, which they bake before the Fire. When baked, it is as white as a Sheet of Paper; I have eat ſome, and found it very inſipid. They could, if they would, make a pretty tolerable good Bread of Maiſe, which they have in Abundance; but they content themſelves with broiling the whole Ear upon the Coals, and eat it ſo without any other Preparation; and really, for my Part, I would prefer it to their *Caſſave*.

We have nothing certain concerning the Origin of the Art of *Baking*, and when it became a particular Profeſſion. My Opinion is, that it began with the Erection of the Tabernacle, that the *Levites* were the firſt *Bakers*, and that the *Shew-Bread* was the firſt Bread made with ſome Art; the Preparation whereof was aſſigned to a particular Set of People. Some will have it firſt invented in Heaven, ſince the *Manna*, the *Iſraelites* were fed with in the Deſart, for a conſiderable Time, is often called the *Bread of Angels*, *Panis Angelorum*. Others pretend that it began in *Greece*, from whence it paſſed to *Italy*, after the War with *Pyrrhus*, about the Year of *Rome* 583. According to *Athenaus*, the *Cappadocians* were the moſt applauded *Bakers*; after them the *Lydians*, then the *Phœnicians*.

To the foreign *Bakers* brought into *Rome*, were added a Number of freed Men, who were incorporated into a Body, or, as they call it, a College; from which neither they, nor their Children, were allowed to withdraw. They held their Effects in common, and could not diſpoſe of any Part of them. Each Bake-houſe had a *Patronus*, who had the Superintendency thereof; and theſe *Patroni* elected one out of their Number each Year, who had the Superintendance over all the reſt, and the Care of the College. Out of the Body of the *Bakers* were every now and then one admitted among the Senators.

To preſerve Honour and Honeſty in the College of *Bakers*, they were expreſly prohibited all Alliance with Comedians and Gladiators; each had his Shop or Bake-houſe, and they were diſtributed into fourteen Regions of the City. They were excuſed from Guardianſhip and other Offices, which might divert them from

from their Employment. By the *Engliſh* Statutes *Bakers* are declared not to be Handicrafts. No Man for uſing the Myſteries or Sciences of *Baking*, *Brewing*, *Surgery*, or *Writing*, ſhall be interpreted a Handicraft, 22 *H.* 8. *c.* 13.

Baking is certainly an Art very uſeful to the civil Society, and *Bakers* may flatter themſelves with the Honour, of having miniſtred both to God and Men; and I could wiſh they would maintain the Honour of their Art, and the great Credit they have acquired in paſt Ages, by their Equity and Compaſſion in this; and not make their indigent and diſtreſſed Fellow-creatures and Countrymen ſubſervient to their Avarice; by ſearching always ſome new Pretext, real, or ſpecious, to raiſe the Price of a Commodity, ſo indiſpenſably neceſſary for our daily Subſiſtance; or by cheating them in their Weight; ſince acting in that ſcandalous Manner, is feeding on the very Subſtance of the Poor, and killing them by Inches. When *Bakers* were ſo much reſpected at *Rome*, and enjoyed ſo many advantagious Privileges, they did not attempt to bribe, as I ſuppoſe, the *Tribune* of the People, to have their *Monopoly* countenanced by him: For if they had, the Senate, always intent to the Welfare of the Commonwealth, had puniſhed both the *Tribune* and the Monopoliſts, according to the Nature of ſuch high Crime, which had been conſidered then as wilful Murther; ſince I ſee no great Difference betwixt taking a Man's Life away, and depriving him of the neceſſary Means to ſupport it; it is equal to cutting his Throat, and to render that Throat uſeleſs to him; and Death, or ſome other ſevere Puniſhment ſhould be equally inflicted on both Offenders. Confiſcation of Goods to the Benefit of the pooreſt Members of the Republick, ſhould be the greateſt Mitigation of the Laws which ought to be enacted againſt Monopoliſt *Bakers*, who thereby would be forced to vomit that innocent Blood they have fatned themſelves with. Their unwarrantable Practices have rendered their Profeſſion, ſo honourable of itſelf, odious and deſpicable; and they are thereby become the Object of the publick Hatred. Though it is always in their Power to retrieve their loſt Reputation by a more tender and compaſſionate Conduct; which would change the Curſes and Maledictions, they are continually loaded with, into Bleſſings, eſpecially from the Poor, whoſe Prayers are always the moſt efficacious.

BAPTISM.

BAPTISM, from the *Greek* βαπτιζω, of βαπτω, is a Sacrament inſtituted by *Chriſt*, for the Ablution of the Original Sin, and for our Initiation into the *Chriſtian* Church.

Some Authors are of Opinion, that this Ceremony of Waſhing was practis'd by the *Jews* after the Circumciſion, long before the coming of *Jeſus Chriſt*; though we don't ſee the leaſt Trace of it throughout the Old and New Teſtament, (at leaſt in the Senſe we take it here) before *John* began to *baptize* in the River *Jordan*, when *Jeſus Chriſt* preſented himſelf to his divine Precurſor to be *baptiz'd*; which *Baptiſm* was but a Diſpoſition to that he inſtituted ſome Time after for the Remiſſion of Sins: Not that he who was all Perfection, and Innocence it ſelf, by his own Eſſence, wanted that Ablution, as if he had contracted the original Sin; but was only willing to *accompliſh all Juſtice*, *i. e.* to carry upon himſelf all the Humiliations due to that Sin, in Satisfaction to his Juſtice, and glorify him by that Abnegation of himſelf; for which he receiv'd, coming out of the Water, a glorious Teſtimony of his Innocence; for the Heavens open'd, and the *Holy Ghoſt* deſcending upon him in the Form of a *Dove*, a Voice was heard, ſaying, *Hic eſt filius meus dilectus, in quo bene complacui.*

There is a great Diverſity of Opinions, among the Eccleſiaſtical Authors, as to the Time of this *Baptiſm*, which the Evangeliſt ſeems to fix at the thirtieth Year of *Chriſt*'s Age; for ſome of them maintain, that he was but twenty-nine Years, and ten Months old: Others, that he had began his thirtieth Year. St. *Chryſoſtome*, and moſt of the *Greek* Fathers, believ'd that it was accompliſh'd; which Date was follow'd by the *Latin* Church, and believ'd that *that* auguſt Ceremony was perform'd the ſixth of *January*.

This Sacrament was inſtituted by *Chriſt*, in Lieu of the Circumciſion, which he was come to aboliſh, as being but a Type of the *Baptiſm*, when he ſent his Apoſtles, after his glorious Reſurrection, to preach his Goſpel to all Nations, and to *baptize* them, in the Name of the *Father*, and of the *Son*, and of the *Holy Ghoſt*; and has been acknowledg'd as ſuch, ever ſince the Infancy of *Chriſtianity*, by all *Chriſtian* Societies, Sects, *&c. i. e.* as to its being of divine Inſtitution, and a Sacrament; but not as to its Effects, its Neceſſity, and the Manner of adminiſtring it, which have caus'd at different Times, and in the ſeveral Ages of the Church, ſeveral Hereſies and Schiſms.

As to the Manner of adminiſtring the *Baptiſm*, all the Fathers, both *Greeks* and *Latins*, agree, that the moſt antient Practice of the Church was by a triple Immerſion, which was done in Form of a Croſs, the Name of one of the three divine Perſons being pronounc'd at each Immerſion. *Tertullian*, *ad Prax.* St. *Baſil*, *De Spirit. Sanct. c.* 27. *Athanaſius Queſt.* 125. St. *Jerome*, *Dial. contra Lucif.* St. *Ambroſe*, *lib.* 2. *De Sacram.* and St. *Auguſtine*, *Serm.* 91. *de Temp.* ſay, that this Ceremony was of apoſtolical Tradition. By the fiftieth Canon of thoſe attributed to the Apoſtles, the Biſhop, or Prieſt, who ſhould adminiſter the *Baptiſm*, with a ſingle Immerſion, were to be ſuſpended from their Office: Becauſe, ſays that Canon, our bleſſed Lord has not ſaid *Baptize in my Death*, but *Baptize in the Name of the Father, of the Son, and of the Holy Ghoſt.*

In the Council of *Conſtantinople*, the *Eunomians*, who us'd to plunge but once, were condemn'd. Though it be certain, nevertheleſs, that the *Baptiſm* is valid, as well with one Immerſion, as with three; and at preſent it is adminiſter'd with Aſperſion only; ſince it ſuffices that the Water touches the Fleſh of the Perſon *baptiz'd*, at the ſame Time that the Words are pronounc'd which make the Form of the Sacrament, where the three Perſons of the bleſſed *Trinity* are to be nam'd, elſe the *Baptiſm* is null; which ſingle Immerſion was declar'd ſufficient, by the ſeventh Canon of the Council of *Toledo*. St. *Gregory*, Pope, *Lib.* 1. *Epiſt.* 41. anſwer'd to a Biſhop of *Seville*, that it was beſt to make uſe of but one Immerſion, in Oppoſition to the *Arians*, who us'd three, becauſe they divided the Natures in the *Trinity*. There is not a very great Likelihood that St. *Peter* had plung'd three Times, the 8000 Perſons who were converted by his two Predications; nor that St. *Paul* was thus *baptiz'd* by *Ananias*.

The Ceremonies of *Baptiſm* have been ſubject to ſeveral Changements, in all the Ages of the Church; and I do not think it improper to make here, for the Satisfaction of the Reader, a ſummary Detail of them, that they may ſee what Reſpect was ſhewn to that Sacrament, and the Diſpoſitions requiſite in thoſe who were to be *baptiz'd*. But before we proceed further, we muſt explain what's underſtood by *Catechumens*, and who they were.

CATECHUMEN, Κατηχουμενος, from κατηχεω, I hear any Thing ſpoken; is a Candidate for *Baptiſm*, or a Perſon who prepares himſelf for the receiving thereof.

The *Catechumens* were diſtinguiſh'd from the *Fideles*, not only by Name, but alſo by their Place in the Church; they were diſpos'd with the Penitents in the Portico, or Gallery, at the Extremity of the Church, oppoſite to the Choir. They were not allow'd to aſſiſt at the Celebration of the Euchariſt, but after Sermon the Deacon diſmiſs'd them with this *Formula*, proclaim'd three Times, *Ite Catechumeni, Miſſa eſt*, Go *Catechumens*, the *Maſs* is done, or the *Maſs* is finiſh'd; which *Formula* is yet retain'd in the *Roman Catholick* Church.

When the *Catechumens* had given their Names, to be regiſter'd among thoſe who aſk'd for *Baptiſm*, their Conduct was narrowly obſerv'd, and they underwent a very ſevere *Examen*. The Uſe of Scrutinies was introduc'd, according to ſome Authors, about the Time of *Leo*, Biſhop of *Rome*, to encourage the *Fideles* to declare what they knew of the Life of the *Catechumens*, before they could be admitted to the *Baptiſm*. This was call'd, by the Antients, the *Examen*.

There was a *Catechiſt* appointed for their Inſtruction, and from the *Catechiſm*, or Inſtruction, they are call'd *Catechumens*. The Inſtruction of the *Catechumens*, was properly of the Deacon's Province, and when they were ready to receive the *Baptiſm*, the Biſhops us'd to give them the laſt Leſſons. We have in St. *Auguſtine*, and in ſome of the other Fathers, ſome excellent Homilies for them. In *Alexandria*, *Pontanus* and *Clemens* us'd to make thoſe Leſſons, which the *Catechumens* were to hear ſtanding; to learn them to be always ready to fight againſt Vice. The Council of *Elvira* fixes the Time of two Years for that *Catecheſis*. St. *Jerome*, *Epiſt. ad Pammach.* informs us, that, in his Time, it was reduc'd to forty Days, and afterwards to eighteen; which us'd to begin at the fourth Fery of the fourth Week of *Lent*. If, during their *Catechumenat*, they happen'd to deny their Faith, we learn, from the Council of *Nice*, that they were to do Penance for the Space of three Years. During the whole Time of their Preparation, thoſe who were married were oblig'd to abſtain from their Wives; and the others from Fleſh and Wine. St. *Cyril* of *Jeruſalem* ſays, that they ought to renew themſelves by Faſting, as the *Serpent* renews his Skin, by paſſing through a narrow Hole of ſome Stone. They were forbidden to frequent the publick Bath, and for that Reaſon they waſh'd their Head and Feet on *Palm Sunday*, to clean themſelves of the Duſt and Dirt they had contracted during *Lent*. They diveſted themſelves of all the Marks of their Dignities, walk'd bare-foot, their Head ſhav'd, their Face veil'd, and wore the *Cilice*.

The Renunciation of the Devil, and of the World, was made at the Church Door, ſtanding naked to their Shirt, and the Face turn'd towards the Weſt. They extended one Hand, as to declare War againſt them, and afterwards lifted up both to Heaven, and blow'd three Times againſt *Satan*. They were cover'd with a vile and deſpicable Cloak, which *Tertullian* calls, *Lib. de Pallio, c. 5.* a *renouncing Veſtment*, or of *Renunciation*. As for the Exorciſms, which were made during the Time of the *Catecheſis*, St. *Auguſtine*, and the other Fathers, aſſure us, that they were always practis'd by the Church. During the Pronunciation of thoſe Exorciſms, the *Catechumens* were bare-foot, in their Shirt, and a Torch lighted in their Hand. Among the *Greeks*, they were anointed all over their Bodies with Oil; and only their Breaſt and Shoulders, among the *Latins*; to give them to underſtand, that they were *Athletæ*, deſtin'd to the *Combat*. St. *Dennis* ſays, that the Biſhop us'd to begin the Unction, which was ended by the Prieſts. Salt was given them, to learn them that henceforward all their Actions were to be ſeaſon'd with Prudence and Diſcretion, according to the Apoſtle's Advice. The Salt ſignify'd, likewiſe, that the City of the Devil was entirely ruinated within them for ever, and was not to be rebuilt, no more than the Cities which the Victorious ſow over with Salt.

St. *Cyril* tells us, *Cat. 2.* that both Men and Women enter'd the Fountain of the *Baptiſtery*, quite naked, and that without Shame, or Scandal; the Deacons undreſs'd the Men, and the Deaconeſſes the Women; and anointed the Body, after the Biſhop had anointed the Head. This Nudity was a Sign of their having diveſted themſelves of the *old Man*, who made Room for the *new*, and of their Return to the State of the original Innocence. The Miniſter of the *Baptiſm* kiſs'd thoſe he had *baptiz'd*, who were afterwards dreſs'd in white Gowns. *Euſebius* informs us, *Lib. 4. De Vita Conſt.* that the Emperor *Conſtantine*, having taken that Veſtment of Innocence, at his *Baptiſm*, would never afterwards wear the Purple. *Tertullian*, *Lib. de Idol.* St. *Jerome*, *Ep.* 128. *Clemens Alexandrinus*, *L.* 2. *Pædag. c.* 8. St. *Gregory Nazian. Or.* 21. and ſeveral others of the antient Fathers, call this Veſtment *Chriſt*'s Veſtment. It was very ſtrait, and girded round the Loins. It was left off the eighth Day; hence, the next *Sunday* after *Eaſter* is call'd *Dominica in albis*, white *Sunday*. Their Heads were adorn'd with Crowns of Flowers, which Ceremony is practis'd yet, among the *Abyſſines*, and the Crown made of Myrtle and Palms. They were made to taſte Milk and Honey, a Sign of the ſpiritual Infancy they enter'd into by the Sacrament; which Cuſtom was obſerv'd till the Year 725. I find that they were preſented likewiſe with ſweet Wine, Milk, Shoes, and ten ſmall Pieces of Money; to ſhew them that it was not by *Avarice* that they were *baptiz'd*.

Theſe were the principal Ceremonies of a *Chriſtian Baptiſm*, in the firſt Ages of the Church. But then it was adminiſter'd but ſeldom; in the primitive Times, eſpecially in the *African* Church, at the Eve of the Feaſt of the *Epiphany*. But under Pope *Leo* it was order'd to be adminiſter'd publickly, at *Eaſter*, and at the Feaſt of *Penteceſt*.

The Sacrament of *Baptiſm* has both its Matter, and Form. For the Matter, any natural Water is held ſufficient, but nothing elſe is allow'd; for this Reaſon, Pope *Stephen* II. excommunicated a Prieſt for *baptizing* a Child with Wine. The Form conſiſts in theſe Words, *I baptize thee, in the Name of the Father, of the Son, and of the Holy Ghoſt*. Both the Matter and Form are wanted, to make the *Baptiſm* valid.

Theological Authors diſtinguiſh three Kinds of *Baptiſm*. 1. *Water Baptiſm*, which is that above-mention'd. 2. *Baptiſm of Fire*, which is the perfect Love of God, join'd with an earneſt Deſire to be *baptiz'd*; call'd alſo the *Baptiſm of the Holy Ghoſt*. On Occaſion, this may ſupply the Place of *Water Baptiſm*. 3. *Baptiſm of Blood*, which is the *Martyrdom*.

The firſt Kind of *Baptiſm* is practis'd, at preſent, among all *Chriſtian* Denominations, the *Quakers* excepted, who prefer the ſecond Kind, *viz. Baptiſmus Flaminis*, the *Baptiſm* of Fire, to it. They pretend, that ſeveral repeated Acts of an explicit Faith in *Chriſt*, which *Chriſt* himſelf propoſes, as the firſt eſſential Condition of our eternal Salvation, when he ſays, *Qui crediderit, & baptizatus fuerit, ſalvus erit*; Whoſoever believes, and is baptiz'd, ſhall be ſav'd; ſuffices for our Initiation into the *Chriſtian* Church, and produces within us the Effects attributed to the Sacrament, which is the Grace of God. That the Ceremony without that Faith, is nothing elſe but a bare, and needleſs Ceremony; whereas Faith, without the Ceremony, has always the Effect deſir'd, ſince that Faith cannot be obtain'd without the Concurrence of the Holy Ghoſt, and conſequently is a Grace of it ſelf. But if that firſt Condition, *qui crediderit*, being immediately follow'd by this other, *& baptizatus fuerit*, is not a convincing Proof that our divine Saviour's Intention was, that one could not procure that End, *ſalvus erit*, without the other, is what all the Fathers, both antient and modern, have determin'd in the Negative. The Efficacy of *Baptiſmus Flaminis*, was only granted by the Church, directed, in all her Deciſions, by the Holy Ghoſt, as ſufficient in the Times of the moſt cruel Perſecutions, while

while the Shepherds of *Chriſt*'s Flock, being diſpers'd by the moſt powerful Enemies of the *Chriſtian* Name, the *Baptiſm* could not be adminiſter'd without an imminent Danger to thoſe who were thrown into Dungeons, or ſhould die in their Bed, before they could have been initiated among the *Fideles*, and purged of the original Sin by *Baptiſm*; but at preſent, that *Chriſtianity* flouriſhes every where, that the Churches are open'd, where that ineſtimable Treaſure of *Chriſt*'s Sacraments are offer'd to all thoſe who will enrich themſelves thereby, without the leaſt Oppoſition or Obſtacle; at preſent, that every Body can, if he pleaſes, be waſh'd in that precious Blood and Water which flow'd from the ſacred Side of *Chriſt*, on the Croſs, and which is the Source of the Sacraments; at preſent, that his Miniſters can diſpenſe his Graces, without Control, or the leaſt Danger, to whom they pleaſe, or judge worthy of them; if the *Baptiſm* of Fire be ſufficient, is what I leave to the Church to determine; for my Part, I cannot believe it ſufficient, eſpecially when I read, in the ſacred Scriptures, that St. *Philip* is not contented with the Faith of the Eunuch of Queen *Candace*; and that the Eunuch himſelf is ſo well convinc'd of the indiſpenſible Neceſſity of *Baptiſm*, that he ſays to the Apoſtle, There's Water, what hinders, then, that I ſhould be *baptiz'd*.

In the primitive Church, none but Adults were admitted to the *Baptiſm*; but as it was conſider'd afterwards, that it was inſtituted for the Ablution of the original Sin, that Children had contracted the original Sin, and nevertheleſs often died without the Benefit of that Ablution, they were alſo admitted to *Baptiſm*. The Church ſupplied for the Imbecility of their Age, for the publick Profeſſion of their Faith, and appointed *Sponſors*, who anſwer'd for them, that they ſhould renounce the Devil, the World, and all its Pomps; and thoſe *Sponſors* engag'd themſelves to have them reminded, when of Age, to be ſuſceptible of any Impreſſions, of what was promis'd for them. The helpleſs Condition they were in, ſeem'd to claim that Mark of the extenſive Charity of the Church, of which *Chriſt* himſelf had given ſo ſignal an Example, when he order'd his Diſciples to let the little Children come to him, to whom, ſaid he, belong'd the Kingdom of Heaven. And to have acted otherwiſe, had been endeavouring to oppoſe his ſacred Decrees; ſince they could not enter that Kingdom without having been firſt waſh'd from original Sin.

Pelagius, and his Diſciple *Celeſtius*, were of a contrary Opinion, pretending, eſpecially *Celeſtius*, that Infants were in the ſame State *Adam* was before his Sin, ſince the original Sin had affected no Body but *Adam* alone; denying the Tranſmiſſion of that Sin to his Poſterity; though *Paulinus*, a Deacon, ſent into *Africa* by *Venerius*, who had ſucceeded *Simplician* in the Biſhoprick of *Milan*, to ſupply the Want of Miniſters in that Province, preſſing cloſe *Celeſtius* to declare openly his Sentiment of the *Baptiſm* of little Children; he ſaid, that he acknowledg'd the Neceſſity of that *Baptiſm*, not to purge them of the original Sin, but to obtain the Kingdom of Heaven.

This Opinion was condemn'd, together with four other Propoſitions of *Celeſtius*, in a Council which *Aurelius*, Biſhop of *Carthage*, had aſſembled, to examine his Doctrine, of the original Sin; which Condemnation oblig'd *Celeſtius* to quit *Carthage*, and to chuſe *Sicily* for the Place of his voluntary Exile; from whence he and his Diſciples wrote ſeveral Letters to the Biſhop of *Rome*, *Marcellinus*, on Children's *Baptiſm*, and original Sin, which Letters were ſent to St. *Auguſtine*, to anſwer them; which he did, by his three Books of the Remiſſion of Sins. This firſt Work againſt the *Hereticks*, was receiv'd with a great deal of Applauſe by the Orthodox. He treats in it of *Infant Baptiſm*, which he maintains neceſſary for the Ablution of original Sin, of which the *Pelagians* denied the Propagation to *Adam*'s Poſterity, admitting only the Imitation thereof. St. *Auguſtine* ſays poſitively, in the ſixth Chapter of the firſt Book, that Children who die without *Baptiſm*, are *in Damnation*, but not attended with the excruciating Torments of Hell.

Several modern Doctors condemn this Opinion of St. *Auguſtine*, as too rigorous, and ſend thoſe Children to a third Place, where they ſuffer no corporeal Pains, though depriv'd of the Sight of God; but, on the contrary, enjoy a natural Felicity. Cardinal *Bellarmine* calls this laſt Opinion falſe, and heretical, though he does not believe that they ſuffer the Pain of the Fire. Father *Petau*, the *Jeſuit*, is entirely of the Sentiment of St. *Auguſtine*, which he endeavours to confirm by the Decree of the Council of *Florence*, which ſeems to him formal on that Subject.

The *Pelagians* aſſign'd to thoſe Children a Place out of the Kingdom of Heaven, into which they dar'd not introduce them, becauſe of the Authority of the Goſpel, which excludes from it thoſe *who are not regenerated by the Water and the Holy Ghoſt*. But when St. *Auguſtine* urg'd them to ſhew, in what Place of the Scripture they could find the Life everlaſting, which they granted to Children dead without *Baptiſm*, they were very much puzzled what to anſwer. As for him, as he knew perfectly well he had plac'd in the *Myſteries of his Election* certain particular Limits to human Curioſity; when he was aſk'd why, of two Children, both born of *Chriſtian* Parents, and both with the original Sin, one dying without *Baptiſm* was damn'd, according to his Sentiment, and the other being *baptiz'd*, was admitted into Heaven? He us'd to anſwer nothing elſe, but what he had learn'd from the Apoſtle, *O altitudo divitiarum ſapientiæ & ſcientiæ Dei, quam incomprehenſibilia ſunt veſtigia ejus!*

The ſame Father attacks again the *Pelagians*, in his fourteenth Sermon, *De verbis Apoſtoli*; on their Diſtinction between Life everlaſting and the Kingdom of Heaven. 'You condemn, ſays he, thoſe you exclude from the Kingdom of Heaven; you condemn them, not by tormenting them, but by ſending them into Exile. For thoſe who are baniſh'd, ſuffer no other Pain, but that of being baniſh'd from their Country; which, if they love their Country, muſt be a great Torment to them; if not, that Depravation of Heart muſt be likewiſe a Sort of Pain. What can be a greater Pain in a Man's Heart, than not to ſeek after the Society of the Saints, and not deſire the Kingdom of Heaven? For if he don't deſire it, that bad Diſpoſition is a Pain in him; if he deſires it, his Charity, which finds it ſelf fruſtrated of what it wiſhes for, muſt cauſe him another great Torment. But let it be, if you pleaſe, ever ſo ſmall, it muſt be ſtill very great for a Perſon, who, having committed no Fault, deſerves no Puniſhment. Take then the Defence of God's Juſtice. How can an innocent Perſon be ſubject to a Puniſhment, let it be ever ſo ſmall?'

Some were of Opinion, that Children, born, as it were, in the Boſom of the Church, and of *Chriſtian* Parents, though dying without *Baptiſm*, enter'd, notwithſtanding, into the Kingdom of Heaven, ſince they were ſav'd by the Faith of their Parents; which Sentiment St. *Auguſtine* refutes, likewiſe, as an Error, in his Book *De Naturâ & Gratiâ*; wherein he proves, that Children, though born of *Catholick* Parents, wanted ſtill the *Baptiſm* to purge them of original Sin.

For my Part, I will not have the Temerity to decide ſo difficult, and ſo important a Queſtion, which has puzzled the greateſt Genius's, and the moſt profound Theologians of thoſe Times. For, if we conſider the Doctrine of St. *Auguſtine* by it ſelf, and abſtracted from all other Authority, we'll find it very ſevere. To refuſe the Sight of God, which is to make the moſt eſſential Part of our eternal Felicity, to little Creatures, who come into the World guilty of a Sin which they have not committed, and which it was not in their Power to commit; and depart from the World charg'd with the ſame Sin, becauſe depriv'd of the Means of being purg'd of it; and are, nevertheleſs,

theleſs, condemn'd for not having been purg'd of it; would not ſuch Conduct of the divine Juſtice appear contradictory of the advantageous Ideas the holy Writ gives us of him, *qui non vult mortem peccatoris, ſed ut magis convertatur, & vivat*; who does not deſire the Death of a Sinner, but that he rather ſhould be converted, and live. And if his Mercy is ſo infinite towards thoſe whoſe whole Life has been nothing elſe but a continual Series of Iniquities, and Crimes, as to be ready at all Times to receive them to a true and ſincere Repentance, and to forgive them all their Offences, even the moſt enormous, and thoſe that deſerve the greateſt Puniſhment; how can it be ſuppos'd that Children, who have never had it in their Power to offend him, and who never knew how to offend him, ſhould be excluded from the Kingdom of Heaven, for a Fault committed by another, whom they have not the leaſt Notion of, who has ceas'd to be, ſeveral thouſand Years before they could be ſuppos'd to have had any *Life* or Being; and therefore could not be imagin'd, with the leaſt Appearance of Reaſon, Accomplices in his Crime. But there were Means found, it is true, to waſh them of that original Spot they contracted, by being the Deſcendants of that firſt Criminal, whoſe Poſterity, by an inſeparable and ſecret Judgment of the divine Providence, has been made reſponſible for his Diſobedience; why ſhould then a very conſiderable Number of thoſe Deſcendants be depriv'd of thoſe Means, before they could be capable to do any Thing, which could cauſe that ſeeming Partiality? Were they *predeſtinated* from all *Eternity* to an eternal Privation of the Sight of God, without which, there can be no perfect Felicity; and if they were, (which would be a criminal Suppoſition) where's that great Mercy, where's that Juſtice, ſo much vaunted, in the Scriptures? Are we not aſſur'd in them, that *Chriſt* is dead for all? Is not the whole human Race intituled to the Benefits of his Death? Was not that precious Source, which flow'd from his ſacred Side, when open'd upon the Croſs, abundant enough to form a ſalutary Bath, capable to contain the whole human Race, without Excluſion; and its Waters ſufficient to waſh us of all our Impurities? And if they are not to prove beneficial to all, without Diſtinction, it ſhould be to thoſe only who have it in their Power to refuſe the Remedy when offer'd to them; and not to thoſe innocent Victims who can be reproach'd with no other Crime, but the involuntary one of being ſprung from a vitiated Origin. It is true, again, that the *final Grace* is a GRACE, and conſequently can be refus'd at Pleaſure; but if it is to be granted, and is often really granted, it ſhould be to thoſe who have done nothing to be ſequeſtrated from it. That Recourſe which St. *Auguſtine* has to the Depth of God's Judgments, is not capable to ſatisfy a rational Mind on that intereſting Subject, nor agreeable to the Sentiments we ſhould have, as *Chriſtians*, of the impartial Equity, and infinite Mercy of our divine Creator.

The Neceſſity of *Baptiſm* was no ſooner conſider'd as indiſpenſible in the Church, but it occaſion'd ſome Confuſion among its Members; for, beſides that abovemention'd, there happen'd another, in 216, about the Validity of *Baptiſm*, with regard to the Miniſters thereof.

Tertullian, in his Book of *Baptiſm*, compos'd before his Revolt, ſpeaks againſt the Validity of that Sacrament, when adminiſter'd by *Hereticks*; who having not, ſays he, the ſame God, nor the ſame *Chriſt*, with the Orthodox, could not, conſequently, have the ſame *Baptiſm*. He had wrote the ſame Thing in a *Greek* Treatiſe, which is loſt. From this Doctrine, *Agrippinus*, Biſhop of *Carthage*, through the Exceſs of an imprudent Zeal againſt the *Hereſy*, took Occaſion to condemn *Baptiſm*, adminiſter'd by any Sect whatever, out of the *Catholick* Church. He aſſembled the Biſhops of his Province, and of *Numidia*, and in Concert with them decreed, that all thoſe who had been *baptiz'd* by *Hereticks* ſhould be *baptiz'd* a new; though they had obſerv'd in the Matter and Form what was practis'd by the Orthodox. St. *Auguſtine*, *Lib.* 2. *Contra Donatiſt.* ſpeaking of this Repetition of the Sacrament, which makes us *Chriſtians*, ſays, that the Cuſtom of receiving into the Church thoſe who had been *baptiz'd* by *Hereticks*, was, in his Opinion, of apoſtolical Tradition, ſince it was not found written any where, but univerſally receiv'd every where; and that *Agrippinus*, Biſhop of *Carthage*, had corrupted, rather than reform'd it, encourag'd thereto by captious Reaſonings, and falſe Appearances of Piety; which had hinder'd him and his Colleagues from finding the Way of Truth in that Queſtion, and has caus'd a great deal of Confuſion in the Church.

Contrary to this Sentiment of St. *Auguſtine*, and following the Example of the *Cataphriges*, and of the *Novatians*, who us'd to *re-baptize* thoſe who came to them from the *Catholick* Church; ſome orthodox Biſhops, eſpecially in the Eaſt, to ſhew, through an indiſcreet Zeal, the Horror they had of the *Hereticks*, began likewiſe to *re-baptize* thoſe who renounc'd their former Errors. This Practice of ſome was ſoon chang'd into a general Law; for St. *Cyprian* aſſures us, *Epiſt.* 73. that ſeveral Biſhops of *Cilicia*, *Cappadocia*, *Galatia*, and of the neighbouring Provinces, being aſſembled in the Town of *Iconia*, in 258; declar'd the *Baptiſm* of *Hereticks* null, and conſequently ought to be adminiſter'd a-new, to all thoſe who ſhould renounce their Errors, before they could be receiv'd into the Church. *Firmilian*, Biſhop of *Ceſarea* in *Cappadocia*, was the moſt zealous Promoter of that Decree; of which Pope *Stephen* being inform'd, they were all excommunicated by him, and all thoſe Churches excluded from his Communion; or, to uſe *Euſebius*'s Terms, *l.* 7. *c.* 4. *Stephen* refus'd to communicate with them, becauſe their Decree was contrary to the antient Cuſtom. They ſent him Deputies, to inform him of their Reaſons; but he would neither ſee nor hear them. *Dennis* of *Alexandria* wrote likewiſe, as well to appeaſe him, as to procure a Reconciliation between them, leſt their Diſunion ſhould cauſe ſome great Schiſm.

From the Eaſt, the Fire ſpread as far as *Africa*; the Biſhops of *Numidia* conſulted on that Subject St. *Cyprian*, whoſe Piety and Doctrine, as well as his *Primacy*, had render'd conſiderable among them. He had no ſooner receiv'd their Letters, but he aſſembled a Synod at *Carthage*, wherein, with the Advice of the other Biſhops, he declar'd, that *Baptiſm* could be valid no where but in the *Catholick* Church, and conſequently that thoſe who ſhould return to it, from their Schiſm, ought to be *baptiz'd* a-new. This Decree was confirm'd ſoon after, in a Council of 71 Biſhops, who acquainted Pope *Stephen* with it, by a *Synodal Letter*. He anſwer'd them, *That no Innovation ought to be made in the Church, that their Deciſion was againſt the Tradition, and that they ſhould content themſelves with receiving to Penance thoſe who ſhould forſake the* Hereticks.

This Reſolution of *Stephen* did not prove very agreeable to St. *Cyprian*, who had already wrote a long Epiſtle to *Jubajanus*, to ſupport his Sentiment; proteſting, nevertheleſs, that he would oblige no Body to it, leſt it ſhould occaſion a Schiſm. Therefore he aſſembled again the Biſhops of *Africa*, *Numidia*, and *Mauritania*, who all, with one Voice, confirm'd the Decrees which had been made in the preceding Synods. He inform'd *Maximilian*, of *Ceſarea* in *Cappadocia*, of this Deciſion; and as he was already irritated againſt Pope *Stephen*, he could not help expreſſing his Reſentment, in his Anſwer to him; in which he ſays ſeveral Things very little becoming the epiſcopal Dignity, reproaching him, among other Things, with *glorifying himſelf without Reaſon, of the Place of his Epiſcopacy, and of the Succeſſion of St.* Peter, *on whom the Foundation of the Church has been eſtabliſhed, introducing ſeveral other Prayers, and conſtituting a Plurality of Churches by his Opinion, that the* Baptiſm *of* Hereticks *was valid. Stephen*, on his Side, defended himſelf with as much Heat; ſo that they both ſhew'd, on that Occaſion, that the Saints, while

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while yet upon Earth, are Men, and that ſometimes a too great Exceſs of Zeal makes the wiſeſt commit ſome very great Faults.

The Queſtion of the *Baptiſm* of *Hereticks* was not yet very well underſtood, and every one had ſome probable Reaſons to defend his Opinion, though, to ſay the Truth, thoſe of the *African* Biſhops, and the Authorities they endeavour to ſupport their Opinion with, are rather pious and moral, than literal and convincing. All the Biſhops of the Province were not of the ſame Sentiment, and St. *Auguſtine* aſſures us, that ſeveral follow'd the Opinion and Reſolution of *Stephen*.

The *Donatiſts* who appear'd ſince, and maintain'd the Neceſſity of that Reiteration, as one of the Foundations of their Sect, could reckon but fifty Biſhops of the Eaſt, and ſeventy-two of *Africa*, to ſupport their Practice by that of the Antients. *Denys*, Biſhop of *Alexandria*, famous for his Piety, prov'd to be one of the moſt ſtrenuous Aſſerters of the Opinion of the *Africans*, and wrote, on that Subject, ſeveral Letters to Pope *Stephen*, and to ſome Prieſts of the *Roman* Church, with a Deſign to reunite them all with the Biſhops, who had embrac'd that Opinion. St. *Auguſtine*, *Epiſt.* 48. ſays of St. *Cyprian*, that it could not be found that he had ever chang'd his Sentiment, though it ſeems probable that he could very well have done it; that thoſe who were pleas'd with his Error, might very well have ſuppreſs'd his Recantation; that ſeveral even maintain'd, that he had never advanc'd it; and that Impoſtors, to cloak themſelves with his Authority, had attributed to him what he had never believ'd.

The *Africans* continu'd long after his Death in the Practice of *re-baptizing*; but, at the firſt Council of *Arles*, was found a very reaſonable Medium between both Extremes; which is, that thoſe of the *Hereticks* who would abandon their Sect, ſhould be interrogated on the Symbol; and if it was found that they had been *baptiz'd* in the Name of the Father, of the Son, and of the Holy Ghoſt, they ought not to be *re-baptiz'd*, but ſhould only have the Hands impos'd on them, that they might receive the Holy Ghoſt; *i. e.* that they ſhould be confirm'd by the Biſhop: That if ſome of them could not anſwer to that Trinity, (which are the expreſs Terms of the Canon) *i. e.* ſhould be found to have not been *baptiz'd* in the Name of the three Perſons, or to have not that orthodox Belief, they ought to be *re-baptiz'd*. This univerſal Practice is to this Day obſerv'd in the Church.

In Fact, as it is an Error to ſay that all *Baptiſm*, adminiſter'd by *Hereticks*, is bad; it is one, likewiſe, to pretend that all *Baptiſm*, coming from them, is good: This Difference is to be taken, not from the greater or leſſer Spot of *Hereſy*, but from the *Dogma's* relating diſtinctly to the orthodox Belief of the bleſſed Trinity.

This Error of *re-baptizing Hereticks*, or thoſe who go from one Sect to the other, is almoſt entirely aboliſh'd in the *Chriſtian* Religion; and all *Chriſtians*, of what Denomination ſoever, do not in the leaſt diſpute the Validity of the *Baptiſm*, provided it be adminiſter'd in the Name of the three Perſons of the Trinity. The *Roman Catholick* Church, who believe *Baptiſm* to be of an indiſpenſible Neceſſity to Salvation, and exclude from the Kingdom of Heaven all thoſe who have not been regenerated by the ſalutary Waters of that Sacrament, does not confine its Adminiſtration to the Clergy alone, but is of Opinion, that in Caſe of Neceſſity a Layman, and even a Woman, can be Miniſter of *Baptiſm*, though *Chriſt* ſeems to have confin'd it to his Apoſtles, and their Succeſſors: For we don't read in the Goſpel, that he gave Power to any Body elſe to preach, and *baptize*; which is the ſecond eſſential Function of their Apoſtolate: But as that Church ſuppoſes that ſhe is in Poſſeſſion of the ineſtimable Treaſure of Grace, which *Chriſt* left his Apoſtles when he retir'd into Heaven; and that ſhe is not to keep that Treaſure hidden, but muſt diſtribute the Riches thereof with a judicious, though liberal Œconomy, to all the Members of *Chriſt*, as far as that Liberality can help them to reunite themſelves to their Chief, in thoſe celeſtial Manſions whoſe *everlaſting Gates* (as the royal Prophet calls them) he has open'd to them by the Effuſion of his precious Blood, and where he expects them, ſitting at the Right Hand of his Father) ſuppoſes likewiſe, that ſhe has the Power to interpret the Intentions of *Chriſt*, as far as it concerns the Salvation of thoſe who can claim a Title to the Benefits of his Incarnation; and that ſhe can appoint what Sort of Œconomiſts ſhe pleaſes, for the Diſtribution of his Graces, when it is impoſſible they ſhould be diſtributed by the Succeſſors of thoſe he had been pleas'd to appoint himſelf; eſpecially when the Danger is imminent. That it would be acting contrary to the Principles of that extenſive Charity, on which the *Chriſtian* Church is founded, and fruſtrate the divine Intentions of the Saviour of the World, to expoſe Children to the Riſque of dying without that Regeneration, which, alone, can introduce them into Heaven; which would often happen, (conſidering the vaſt Number of Accidents Children are expos'd to when they come firſt into the World) if none but the true Miniſters of the Sacraments could adminiſter the *Baptiſm*, whoſe Place ſhe will have ſupply'd by the firſt Perſon preſent, when it is judg'd that by waiting for a Prieſt, the Infant would run the Riſque of dying without *Baptiſm*; which ſalutary Precaution cannot be blam'd, eſpecially by thoſe who admit *Baptiſm* as neceſſary to Salvation, nor even by thoſe who are of a contrary Opinion: For, as almoſt all *Chriſtian* Sects not only *baptize*, but likewiſe confeſs *Baptiſm* to be a Sacrament, and conſequently to confer the Grace of *God*; there can be no Crime in adminiſtering it by Precaution, nor even in the Incertitude, that it be neceſſary to Salvation, or not; for if it be neceſſary to Salvation, though not adminiſter'd by a Prieſt, the Impoſſibility we were in of having it adminiſter'd by a Prieſt, and our being certain that it is adminiſter'd, muſt be a greater Satisfaction to us, than if it was not adminiſter'd at all, and renders our Inquietudes leſs. And if *Baptiſm* is not neceſſary to Salvation, as we all agree that it is a very good Thing in it ſelf, there can be no Inconvenience in the Adminiſtration of it; for if it don't produce any good Effects, it would be contradicting our ſelves to ſuppoſe that it can produce any bad ones. Thus we reaſon in our worldly Affairs; why ſhould we not be as cautious in what relates to the eternal Felicity of our Children, who often, by our ridiculous, and moſt cruel Obſtinacy, or Negligence, die, leaving us in the Incertitude of it. Should our fanatical Prejudices over-ballance that Tenderneſs Nature it ſelf claims from us for them? Or ſhould that Tenderneſs extend no farther than that Inſtinct we have in common with the Brutes? What Reproaches ſhould we ſubject our ſelves to, if our Children were to loſe their tranſitory Life by our Negligence? Could we even forgive our ſelves, if we thought that we could have call'd to their Aſſiſtance ſuch and ſuch Perſons, who, we are told, could perhaps have ſav'd their Lives, or neglected to apply ſuch and ſuch Remedy, which had been recommended to us as a Specifick in the Malady, which has carried them off? Why ſhould we not be then as cautious, and as careful, of their eternal Life? Why ſhould we neglect any Means offer'd to us to procure them that Life, as much preferable to the other, as a Sound, or a Chimæra, is to a Reality? Is then an Eternity of ſo little Value, as not to deſerve to be purchas'd, at any Rate? How often do we pleaſe our ſelves with the Thought, that if our Children die we have nothing to reproach our ſelves with, ſince we have done all in our Power to ſave their Lives? With what greater Satisfaction ſhould we ſay that of their eternal Life? What! becauſe we are of an Opinion different from all other *Chriſtian* Societies; becauſe we have the criminal Preſumption to give a forced Senſe to the literal Senſe of the Scripture, which aſſures us, that *nihil inquinatum intrabit Regnum Cælorum*;

lorum; That nothing unholy ſhall enter the Kingdom of Heaven: Becauſe, contrary to the expreſs Commandment of *Chriſt* to his Apoſtles, who order'd them to *baptize* all Nations he ſent them to, we deny the Neceſſity of *Baptiſm*; muſt our Children ſuffer for our criminal Preſumption? If they have contracted the original Sin, can they enter the Kingdom of Heaven, charg'd with that original Sin? And if they can, why has the ſecond Perſon of the bleſſed Trinity been incarnated, has ſuffer'd and died, when we are aſſur'd that it was to open to us the Kingdom of Heaven, which we had loſt by *Adam*'s Diſobedience? You'll ſay, perhaps, that his precious Blood has waſh'd that original Sin: If ſo, why ſhould he ſay himſelf, *qui crediderit, & baptiſatus fuerit ſalvus erit*; Whoever believes, and is *baptiz'd*, ſhall be ſav'd? Why ſhould he himſelf make our Salvation depend on that *Baptiſm*, if we can be ſav'd without it? And if that Commandment given to his Apoſtles *to baptize*, is not an obligatory Commandment, but only an Advice, (which is a falſe Suppoſition) why ſhould we refuſe to follow that Advice? If we pretend to tend towards the *Chriſtian Perfection*, can we do it without following as much as it is in our Power, all the Advices, as well as the Precepts? And if we are not, can we err, or deceive our ſelves, in following them? Can we find any Thing in that ſacred Book, contrary to Morality, or prejudicial to our ſelves? Can we find in it any Thing which could countenance our Obſtinacy with Regard to *Baptiſm?* Can we quote any Paſſage from it, whereby we are forbidden to *baptize* our Children, or that it is a Crime to do it? They are not in a Condition to anſwer for themſelves; for *Chriſt* ſays, *qui crediderit, & baptiſatus fuerit*; therefore as they cannot believe they are not to be *baptiz'd*. A very juſt Concluſion! and very well deduc'd from the Premiſes! If *Chriſt* had ſaid, none but he that believes ſhall be *baptiz'd*; or none but thoſe that ſhall be capable to make an open Profeſſion of their Faith, ſhall be *baptiz'd*; there would be ſome Appearance of Reaſon to refuſe *Baptiſm* to Children newly born: But there's nothing of that in this Paſſage; whereby it appears that *Chriſt*'s Intention is, that we ſhould not; that it is not ſufficient to Salvation to believe without being *baptiz'd*; and that Faith, without that Regeneration, is nothing elſe but a dead Faith.

I confeſs, that Children are not in a Condition to aſk for *Baptiſm*; neither are they in a Condition to aſk for their temporal Preſervation; therefore we muſt abandon them to their Fate, and let them help themſelves if they can, if not, they muſt die. As for my Part, I ſee no Difference between both Caſes; but if they cannot anſwer for their Faith, does not the Church, their Parents, or their *Sponſors*, anſwer for their Faith? And thoſe who anſwer for their Faith, do they not contract, at the ſame Time, an Obligation of inſtructing them in that Faith? Will they have a more implicit Faith, when twelve, fifteen, or twenty Years of Age than they have; and for one that has, how many do we ſee, that have none, and only ſpeak as taught by their Parents, without knowing often what they are ſpeaking of? Is it any Difference between that Profeſſion, and that which their Parents could have made, if they had been *baptiz'd* as ſoon as they were born, or are not rather both Profeſſions the Profeſſion of their Parents? With this ſingle, and inſignificant Difference, that it only paſſes through two different Organs.

I am not, however, in this Caſe, entirely of the Opinion of St. *Auguſtine*; for I cannot believe, or rather I judge it incompatible with God's infinite Mercy, that an innocent Creature, who has never offended, ſhould be depriv'd of the Benefits of his Death, as if in ſome Manner created for Damnation, and only brought to Light to be a few Moments after condemn'd to an eternal Darkneſs, or to die before he could be ſenſible that he has liv'd. If *Baptiſm* is an eſſential Condition of our Salvation, this Caſe of an Infant's Death, before we can poſſibly have Recourſe to that Remedy, muſt be excepted; otherwiſe it would be putting Limits to God's infinite Mercy and Power, who, by ſome Secrets of his profound Wiſdom, which we cannot penetrate, and in that inexhauſtible Source of Mercy which has flow'd continually through his Church ever ſince it was firſt open'd upon the Croſs, has left ſome Means, unknown to us, to ſave thoſe innocent Victims of a foreign Guilt from the Maſs of Corruption, than thoſe procur'd to us by *Baptiſm.* For how can we reaſonably ſuppoſe the *Baptiſm of Fire*, which the Church confeſſes to be ſufficient for the Regeneration of the Adults, reduced to the Impoſſibility of being *baptiz'd*, before they render the laſt Tribute to Nature; and that, at ſuch a critical Conjuncture, their Faith, and the ardent Deſire of being *baptiz'd*, have the ſame Effects as *Baptiſm* it ſelf; and be ſo cruel to refuſe to Children, reduc'd to the ſame Impoſſibility, ſome Means of the like Nature? Is then the Salvation of Adults dearer to God, than that of thoſe poor Children who do not aſk, or deſire to be *baptiz'd*, becauſe he will not permit them to form ſuch Deſire, and are not *baptiz'd* becauſe he has not allow'd them Time for it. Would not their Complaints, during a whole Eternity, of their being damn'd becauſe they were not permitted to be ſav'd, be a Sort of Reflection on the divine Juſtice; and would not that eternal Truth, that *Chriſt* is dead for all, be revok'd in Doubt? Therefore have we not a very great Reaſon to believe that thoſe Children who die in the Womb of their Mother, or in the Birth, or a few Moments after their Birth, are as much favour'd as the Adults who die without *Baptiſm*, though they ardently wiſh for it; and that their Innocence and Imbecility contribute as much towards their Regeneration, as the Impoſſibility others are reduc'd to of being regenerated by Water; and that the one and the other are regenerated by the *Holy Ghoſt?*

This muſt not be underſtood of Adults, who die without *Baptiſm*, though it has been ſo often in their Power to have it adminiſter'd to them; for as our Salvation is a ſpecial Grace of God, he is not oblig'd to have Recourſe to other Means to operate that Salvation, than to thoſe he has determin'd it ſhould be operated by, and which he is pleas'd to mention in his Goſpel. We flatter our ſelves, if we imagine that one ſuffices, where he propoſes two; *i. e.* that when he ſays, that *qui crediderit, & baptiſatus fuerit, ſalvus erit*; Faith without *Baptiſm* ſuffices: For if that had been the Deſign of our divine Saviour, he had ſaid, *qui crediderit, vel baptiſatus fuerit*, or *qui crediderit* only, *ſalvus erit*; ſince his Diſcourſe was always conciſe, without the leaſt Superfluity of Words: Therefore his mentioning both Conditions, ſhews plainly, and without Equivocation, that one could not operate our Salvation without the other: Beſides, have we the leaſt Certitude that one will do, but, on the contrary, are more than certain that both are ſufficient? Why ſhould we be ſo far our own Enemies, as to depend on an Improbability, when we can ſo eaſily ſecure our ſelves on that Side? Nothing but Obſtinacy, or Folly, can induce us to act, or think ſo contrary, not only to the Goſpel, but even to the Dictates of our Reaſon. Would we be contented, when we purchaſe an Eſtate, with a Title which every Body elſe but our ſelves believe precarious, if we could have two very good and inconteſtable ones? And if we would, what Opinion could the moſt ſenſible Part of Mankind entertain of our Judgment? I hope the Reader will be perſuaded that I ſpeak in this Place without Partiality or Prejudice; that I advance no new *Dogma's*, ſince I content my ſelf with expoſing *naively* the Sentiments of the antient Fathers, and the Practice of the primitive Church; and if I have had the Preſumption to add to it ſome Reflections of my own, I endeavour to render them agreeable to thoſe Sentiments, and to that Practice, without pretending to make my ſelf Arbiter of the Differences which ſubſiſt yet on this important Subject; or expecting that thoſe Reflexions ſhould be minded, otherwiſe than they are founded on the Prin-

Principles of *Chriſtianity*, and authoriz'd by the Goſpel it ſelf, which ſhould always be our Guide in Matters of Faith.

It appears plainly, by what I have ſaid, that ſeveral Diſputes have ariſen in the Church touching the Form of *Baptiſm*, and the Manner of adminiſtring it; the oppoſite Parties have all agreed in this, that it was of an indiſpenſible Neceſſity for our Initiation into the Church of Chriſt, and none has ever dared to advance, that without it we could be admitted into the Society of the Faithful, or even worthy of being called Chriſtians; if ſome have been capable ſince to find ſomething in the Scripture which could ſupport another different Belief, and are authoriſed to conſider, as Chriſtians, thoſe who are not diſtinguiſhed from the Jews, Pagans, and Infidels, by that ſacred Characteriſtick, they have been happier than me, who ſhould have been extraordinarily well pleaſed with ſuch new Diſcovery, which could flatter me with the Hope to meet in Heaven, with thoſe who by their Piety, Equity, Charity, and all the other chriſtian and moral Virtues, capable to adorn our Soul, ſeem to claim an unconteſtable Right to it, though they had entered through a Door different from that, which Chriſt himſelf, his Apoſtles, and their Succeſſors, were pleaſed to ſhew us; but alas! where could that be found but in the Scripture; and in what Part of the Scripture can it be found in; is what is not come yet to my Knowledge; beſides, if it could even be found, it would then appear ſuch a Contradiction, between the Oracles of the Holy Ghoſt, that they ſhould loſe a great deal of their Authority, and make a judicious Mind queſtion the Truth of the whole.

No Conſideration whatever ſhould engage us to abandon ourſelves to that criminal Complaiſance of deceiving thoſe who claim the ſame Title with us, to the Benefits of Chriſt's Paſſion, in ſo tender a Part as is that of their eternal Salvation; what! under Pretence of a pretended tender Conſcience, muſt we indulge them in their erroneous Sentiment; under Pretence, that they are entirely bent on their own Deſtruction, muſt we lend them a Hand to haſten them to the Precipice? Is not he that ſees unconcerned, a Murder committed, when it is in his Power to hinder it, equally guilty with the Murderer? Is that imitating the Zeal of the firſt Founders of the Chriſtian Church, whom the moſt cruel Perſecutions, could not deter from ſhewing to the moſt formidable Powers of the Earth their Errors, and the Ridicule of their Superſtitions? If that Charity we boaſt of, and whereby we pretend to be obliged to rank among Chriſtians, thoſe who refuſe obſtinately to be ſuch, is a true chriſtian Charity, why has it not been practiſed in the primitive Church? Why did not the Apoſtles uſe the ſame Indulgence towards the *Jews*, who profeſſed a Religion, whoſe principal Articles had been dictated by God himſelf? Was not the Circumciſion ordered by the Law of *Moſes?* Had not Chriſt ſubmitted himſelf to it? Was not that Circumciſion a Type of *Baptiſm*? And could not the Apoſtles have pleaded the tender Conſcience of the *Jews*, as an Excuſe for indulging them in the Practice of that Part of the Ceremonial Law excluſively of *Baptiſm*, with far greater Appearance of Reaſon, than we can pretend to have, to indulge thoſe among us, in their Oppoſition to *Baptiſm*, when they can plead nothing which could ſupply its Place? In acting thus, what Idea can we pretend to give to the other Churches of our Faith; ſince we ſeem to treat the chief Articles of it in ſo indifferent a Manner, and to follow a Method, of which we have no Precedent, in the Hiſtories of the Church, and which had been abhorred as well by the Hereticks of all Ages, as by the Orthodox, of which we have ſo many Inſtances, in the Conduct of the *Cataphriges*, *Novatians*, *Eunomians*, *Donatiſts*, &c. For if thoſe Hereticks had not thought *Baptiſm* abſolutely neceſſary for our Initiation into the Chriſtian Church, what could have induced them to rebaptiſe thoſe who came from the Orthodox to them? If they had been of the Opinion, that Faith without *Baptiſm*, is ſufficient to diſtinguiſh a *Chriſtian* Society from *Jews*, and Idolaters, why could they not content themſelves with that Faith, and admit into their Aſſemblies, all thoſe who profeſſed publickly that Faith, without that Condition of a Regeneration by *Baptiſm*; and if they were not perſuaded that that Sacrament was abſolutely neceſſary to Salvation, at leaſt in Adults, why ſhould they have put their Proſelytes to the Trouble of being baptiſed a-new, when they had been already baptiſed in another Society, ſince by having acted as we do, they had avoided all thoſe Troubles and Confuſions which their Precautions cauſed in the *Chriſtian* Church? But we give into another Exceſs, for we are ſo very complaiſant, that we even call tender Conſcienced Brethren, thoſe who were never baptiſed. On what Foundation can a Society be called a *Chriſtian* Society, which has no Sacraments? Or has ever any *Chriſtian* Society, except of later Times, pretended to be *Chriſtians* without Sacraments? For thoſe Societies, who deny the Regeneration by Water, have no Sacraments; ſince from the very Foundation of the *Chriſtian* Church, a *Sacrament* has always been accounted *Signum viſibile Rei inviſibilis*, a Sign viſible of a Thing inviſible. Where's the Sign viſible of that pretended *Baptiſm* by the Holy Ghoſt alone? For if the Water was not neceſſary in the Adminiſtration of that Sacrament, why would Chriſt be baptiſed by Water? Why could not St. *Philip* content himſelf with the publick Profeſſion of Faith of the Eunuch of Queen *Candace*? Why would St. *Peter* take the Trouble of baptiſing that great Multitude, which was converted by his two Predications? And if we have not thought proper to reform that Sacrament; *but on the contrary believe that none can enter into the Kingdom of Heaven except he be regenerated, and born a-new, of Water and of the Holy Ghoſt*, as we expreſs it in formal Terms in the Adminiſtration of *Infant-Baptiſm*; if in the ſame Place we *call upon God the Father, through our Lord Jeſus Chriſt, that of his bounteous Mercy he will grant to this Child, that Thing, which* BY NATURE HE CANNOT HAVE, *that he may be baptiſed by Water and the Holy Ghoſt, and* RECEIVED INTO CHRIST'S HOLY CHURCH, *and be* MADE A LIVELY MEMBER OF THE SAME. If again, we *call upon God for this Infant, that he, coming to his holy Baptiſm, may receive* REMISSION OF HIS SINS BY SPIRITUAL REGENERATION; do we not contradict all this, by indulging *our tender Conſcience Brethren*, (as we call them) in a contrary Opinion? For can we have the Preſumption to rank them among our Brethren, and admit of a myſtical Affinity with them, when we confeſs, that we cannot be *made a lively Member of Chriſt's holy Church, without being baptiſed by Water and the Holy Ghoſt?* That we cannot *receive Remiſſion of the original Sin* (ſince an Infant can have no other) *but by Baptiſm*? Can we plead our very extenſive Charity on this Occaſion? And if we do, what Sort of Charity is ours? Would it be an Act of Charity to help a Perſon already blind of one Eye, to extirpate the other, becauſe he is willing to do it; and that, by endeavouring to hinder him from doing it, we might run the Riſk of diſobliging him? Why don't we uſe the ſame Indulgence towards the *Roman Catholicks*, and call them likewiſe our tender Conſcience Brethren; which we could do with a great deal more Reaſon, ſince they are baptiſed, as we are, and conſequently we cannot but confeſs that they are *Chriſtians*, nay that we have even received our Chriſtianity from them; and nevertheleſs we exclaim and inveigh againſt them, as againſt Wolves in the Sheepfold, while we cajole, and admit into our Society, thoſe who have not the very firſt diſtinguiſhable Character of Chriſtianity? Where's our Zeal for the Edification of the Lord's Houſe, and for the eternal Salvation of our Brethren; we know that they are born like us in the original Sin, we confeſs that nothing but the ſalutary Waters of *Baptiſm* can waſh that Sin; we are conſcious that we cannot enter the Kingdom of Heaven, before we be waſhed of that original Sin,

and nevertheleſs, we indulge our tender Conſcience Brethren, ſo far as to leave them in their voluntary Ignorance on that Point; whereas were they once convinced of the Neceſſity of *Baptiſm*, they would add a new Luſtre to the *Chriſtian* Church by their Chriſtian and moral Virtues, which they practiſe, out of it, to the Edification of the whole World. How cruel we are to contribute as much as is in our Power to the Perdition of thoſe honeſt Souls, who want nothing elſe but *Baptiſm* to render them as perfect, almoſt, as our celeſtial Father is perfect; who by their Equity, Charity, Diſintereſtedneſs, Hatred of the World, and of its Pomps, give us a true Model of the Life which the Saints lead in the celeſtial Manſions.

In the Primitive Church, and to this Day in the *Roman Catholick*, the Water, for Perſons to be baptiſed with, was preſerved in Places or Edifices, called BAPTISTERIES. In the Churches which baptiſed by Immerſion, the *Baptiſtery* was a Kind of Pond, where the *Catechumens* were plunged; though in many Places the next River ſerved for a *Baptiſtery*. In Aftertimes the *Baptiſtery* was a little Building adjoining to the Church, purpoſely appointed for the Adminiſtration of this Ceremony. There were ſeveral Fonts and Altars in each *Baptiſtery*, becauſe then they baptiſed a Number at once, all of whom received the Euchariſt immediately after. At firſt theſe *Baptiſteries* were only in the great Cities; but they afterwards allowed Pariſhes to have Fonts, for the more commodious Adminiſtration of *Baptiſm*. This Right was confined to Pariſhes alone; and if any Monaſteries were found with *Baptiſmal* Fonts, it was becauſe they had *Baptiſmal* Churches in another Place; though the Biſhops ſometimes granted them to Monks, upon Condition that they would have a ſecular Prieſt along with them, to take Care of the People; but they afterwards found Means to throw off the Prieſt, and make themſelves Maſters of the Church, and attach it, with its *Baptiſmal* Fonts, to their own Monaſtery. In the *Gallican* Church none but Parochial Churches are allowed to have *Baptiſteries*, or, as they call them, *Fonts Baptiſmaux*, where all Children are carried to be baptiſed, except in the Caſes of an extreme Neceſſity heretofore-mentioned.

When the Rector, or his Curate, is informed that there is a Child to be baptiſed, he comes to the Church, and having put on his Surplice, and a Stole, he goes to meet the Child at the Entrance of the Church, where he reads the Exorciſms, then he throws one of the Ends of his Stole over the Child, and introduces him into the Church, then he gives him the Name, after which he carries him to the Fonts, where he makes the Unctions with *Chriſma* and the bleſſed Oil. Beginning on the Breaſt, and ending at the Shoulder, and concludes with the Aſperſion, which he makes on the naked Head in the Form of a Croſs, receiving nothing for his Trouble, but what the Godfather and Godmother are pleaſed to leave at the Fonts.

The Water for *Baptiſm* is bleſſed in the *Roman* Church twice a Year, with great Ceremony, *i. e.* on the Eve of *Eaſter*, and on that of the Pentecoſt. Though the Belief of that Church is, that all Sort of natural Water is ſufficient for the Adminiſtration of *Baptiſm*. This Cuſtom of bleſſing the Water of the *Baptiſmal* Fonts, is very antient; ſince we find that it was practiſed in the *African* Church in the fourth Century.

Theſe ſalutary Waters are of ſuch Efficacy, that we find in the eccleſiaſtical Hiſtory, that they have ſeveral Times procured the Health of the Body, as well as that of the Soul. *Socrates* ſays, *l.* 7. *c.* 4. that in 408 there was a *Jew* at *Conſtantinople*, who for ſeveral Years had been paralitick; without the moſt ſkilful Phyſicians having been capable to give him any Relief, 'till not knowing whom to apply to elſe upon Earth, he thought of turning Chriſtian, hoping to find in the ſalutary Waters of *Baptiſm*, what he had ſo long expected, but in vain, from human Skill. As ſoon as *Attieus*, Biſhop of *Conſtantinople*, was informed of his Intention, he came to viſit him, inſtructed him in the Chriſtian Religion, and ſometime after, had him carried on his Bed to the Church, where he baptiſed him; the *Jew* was not fruſtrated in his Expectation, for his Faith ſaved both his Body and Soul; ſince he came out of the Water in perfect Health.

Here we conclude our Treatiſe on *Baptiſm*, and proceed to give a Deſcription of a certain profane Ceremony practiſed by Sailors, both on Perſons and Veſſels, when at certain Latitudes at Sea, call'd alſo by them *Baptiſm*, or Chriſtening.

This Sort of Chriſtening, happens but under the Line and the Tropicks, and only on the Veſſels and Perſons, who paſs thoſe Places for the firſt Time. If it be a Veſſel, the Carpenters, ſhouldering their Axes, come in the Ceremony to aſk the Captain that he'll be pleaſed to pay for the Chriſt'ning of the Ship, unleſs he'll rather chuſe to have the Beak-head cut off, pretending they have Right to do the one, if the Captain, or Maſter refuſes to comply with the other. Therefore to avoid having his Ship disfigured, he capitulates with thoſe *Mohauks*, and ranſoms his Ship, either with Money or Liquor, which is put to their Option. In a *French* Man of War it is either twenty Crowns or a Hogſhead of Wine; the Money being almoſt always preferred to Liquor, the one or the other being immediately delivered to the Claimants, who, on thoſe Conditions let the Ship paſs unmoleſted.

While the Carpenters are capitulating with the Captain, a Pilot dreſſes himſelf in a Calf's Skin, or Cow's Skin, with a Furr Cap, and his Face adorned with two frightful Muſtachoes, *a la Suiſſe*, takes his Poſt in the round Top, attended with a Train of Sailors, armed with Buckets full of Water, waiting for the Captain, who, after he has diſpatched his Gueſts, the Carpenters, comes upon Deck, to whom the old Man *Tropick*, as he is pleaſed to ſtile himſelf, calls, aſking him whence he came, and whither bound? Which Queſtions being anſwered by the Captain, through a ſpeaking Trumpet, to denote that he is ſpeaking to ſome Body at a vaſt Diſtance from him, *Tropick* tells him, that ever ſince he has been in that Latitude, *i. e.* from the Beginning of the World, he don't remember to have ſeen his Ship paſs that Way, no more than ſeveral of the Crew and Paſſengers; and therefore muſt come down to take the uſual Tribute, which he exacts from all thoſe, who, for the firſt Time, paſs through his Dominions, which being acquieſced to by the Captain, *Tropick* deſcends at the Sound of the Trumpets, the Beating of Drums, and the Noiſe of Kitchen-Inſtruments, his Limbs trembling, his Head paralitical, and almoſt worn out with Age, and goes to ſet himſelf on a mock Throne, prepared for him at the Foot of the Main-Maſt, having on his Right one of the Gunners holding a Waggoner or other Sea-Book, and on his Left the Cook, with a Pot full of black Stuff. At his Feet is placed a large Tub, full of Water, a-croſs which is laid a Handſpike, on which Seat every one is brought to his mock Tribunal, who is obliged to ſwear on the Book preſented to him by the Gunner, that he'll never kiſs any Sailor's Wife in the Abſence of her Huſband, that he'll make others obſerve the ſame Ceremony, he practiſes at that Time, and ſeveral other ridiculous Oaths. Afterwards, if he lays down ſome Money in a Plate preſented to him by ſome of *Tropick*'s Courtezans, he eſcapes with a little ſprinkling of Water, and a ſmall black Croſs, made by the Cook, on his Forehead, to denote that he has paid the Tribute; if not, the Handſpike is drawn from under him, and his Breech falls in the Tub, which is ſoon followed by Streams of Water poured upon him from the Shrouds. The Ceremony over, the Officers and others who have paid the Tribute retire to cloſe Quarters; and the Tars are left to chriſten one another, which they do plentifully, without Diſtinction, of thoſe who have not paſſed the *Tropick* or Line, from the others who have done it ſeveral Times; and if by Chance ſome Officers or others, who have paid the Tribute, chance to appear upon Deck, they ſeldom

dom escape receiving something of the Aspersion. The whole is concluded by a Pantomime of a whipping Bout, acted by the Ship's Boys, who in Honour of the Day are obliged to whip each other; which they do at first with some Reluctancy, 'till they feel the Smart, for then he who finds his Posteriors a little too freely dealt by, exerts himself likewise on those of his Leaders, and so on, 'till at last, every of them become a *Busby*. The Rest of the Day is spent, if the Weather permits it, in drinking and carouzing.

BOOKS.

BOOK (formed from the *Saxon*, *Boc*, which comes from the Northern *Buech*, a Beech Tree, on which our Ancestors used to write) is the Productions of Persons of Wit and Learning, digested in some Form or Order, and reduced into Writing for the Instruction or Entertainment of others, but too often for the Depravation of their Manners; and to have it transmitted to Posterity.

BOOK is distinguished from *Pamphlet*, or single Paper, by its greater Length, and from *Tome* or *Volume*, by its containing the whole Writing; which is often divided into several Volumes.

Books are commonly divided into *divine* or *sacred*, and *human Books*.

The divine or sacred *Books* are either wrote by Inspiration, as the *Pentateuch*, the *Prophets*, the *Books* of *Solomon*, the *New Testament*, &c. which several *Books*, collected together, compose a whole one called the *Bible*; or as an Explanation of the most difficult Passages of the inspired *Books*, as the several Interpreters of the Scripture, the antient Fathers of the Church, *&c.*

The BIBLE is the most valuable, and most respected of all the divine, sacred *Books*, as containing, the first Precepts, given to *Moses* by the Almighty himself, amidst the Thunder and Lightening of *Mount Sinai*, of the religious Worship and Ceremonies, he was to be adored with upon Earth, and the first Articles of a true Faith.

The *Bibles* are distinguished according to their Language, into *Hebrew*, *Greek*, *Latin*, *Chaldee*, *Syriack*, *Arabick*, *Coptick*, &c.

The first Traduction of the *Bible* is, that of the *Septuagint*, made 280 Years before the Incarnation of *Jesus Christ*, through the Care of *Demetrius Phalereus*, under the Reign of *Ptolemy Philadelphus*, King of *Egypt*, to perfect the famous Library of *Alexandria*, which contained 200,000 Volumes. This Translation was received by the *Jews*; and our Saviour, as well as his Apostles, make use of it, in the Gospel; but it was corrupted soon after the Birth of our Saviour, as well by the *Jews*, as through the Ignorance of the *Copists*. *Origen* was the first who attempted to purge it of its Imperfections, and restore it to its pristine Purity. In which noble and useful Undertaking he was succeeded by the Martyr *Lucian*. *Hesychius*, likewise applied himself to it, and St. *Jerome* perfected it.

Antient Authors do not agree among themselves as to the Manner of this Translation. Some say that the *Seventy* worked upon it separately, and that comparing afterwards their several Versions together, they were all found alike in all Things. Others pretend, that they worked at it two and two. And others, that they did it altogether, consulting one another on the most difficult Passages. The first Manner is considered as a Fable, and as mere Romance, by a great many very learned Divines.

We have at present Bibles, in the several Languages above-mentioned, both Manuscript and printed, and almost all according to the Version of the *Septuagint*, but very imperfect. *F. Simon* is of Opinion that the oldest Manuscript *Hebrew Bibles* are not above 6 or 700 Years: Nor does *Rabbi Menahem*, who quotes a vast Number of them, pretend that any exceed 600 Years. The best are those copied by the *Jews* of *Spain*, and the most common those copied by the *Jews* of *Germany*.

The best printed *Hebrew Bibles*, are those published in *Italy* by *Pesaro* and *Brets*, and there are none correct, but those printed under the Direction of the *Jews*, because a great deal more perfect in the *Hebrew*, which is a Language natural to them, than any other Nation. The *Hebrew Bibles* of *Dan. Bomberg*, printed in Folio and Quarto at *Venice*; the first in 1517, called *the Bible of* Fœlix Pratensis, the Person who revised it, and which is the less exact; and the second in 1526, with the *Massora* and the Commentaries of several *Rabbins*, are the most esteemed both by the *Jews* and *Christians*. Mr. *Chambers* says, that these Bibles were printed in the sixth Century, which is several Centuries before the Art of Printing was first invented; but this is not the least unpardonable Fault committed by that Author. In 1548, the same *Bomberg* printed the *Folio Bible* of *Rabbi Benchajim*, the best and most perfect of them all; it is distinguished from the first of the same *Rabbi*, by the Comment of *Rabbi D. Kinchi*, on the Chronicles, which is not in the preceding. It was from this Edition that *Buxtorf* the Father, printed his Rabbinical *Hebrew Bible* at *Basil* in 1618; which is full of Faults, especially in the Commentaries of the *Rabbins*, where that learned Man altered some Places that were against the Christians. *Le Modena*, a *Rabbin* of *Venice*, published, the same Year, a new Edition of the *Rabbinical Bible*, which he pretends to be more correct than the first.

The *Hebrew Bibles* printed in Quarto, at *Antwerp*, by *Plantin*, in 1566, are very beautiful, both for the Characters and Paper. Those of *Manasseh Ben-Israel*, published at *Amsterdam*, both in 4to and 8vo, the first whereof being in two Columns, is very commodious to the Reader. In 1634, *R. Jac. Lombrose* published a new Edition in 4to at *Venice*, with small literal Notes at the Bottom of each Page, where he explains the *Hebrew* Words by *Spanish* Words. This Bible is much esteemed by the *Jews* at *Constantinople*: In the Text they have distinguished between Words where the Point *Camets* is to be read with a *Cametz-tuph*, that is by an *o* and not an *a*. The most beautiful and correct of all the *Hebrew Bibles*, in 8vo, are the two of *Jo. Athias*, a *Jew*, of *Amsterdam*. The first, of 1661, is the best Paper; but that of 1667, the most exact; that however published at *Amsterdam* by *Vander Hooght* in 1705, is preferable to any of them.

Of the three *hebraising Protestants*, which have undertook to revise and publish the *Hebrew Bible* after *Athias*, viz. *Clodias*, *Jablonski*, and *Opitius*; that in 4to of *Opitius*, published at *Keil* in 1709, is the best; though he has this Fault in common with the two others, that he has made Use of no Manuscripts but those of the *German* Libraries, neglecting the *French* ones, which are certainly the best; though they have all three this Advantage, that, besides, the Divisions used by the *Jews*, both general and particular, into *Parashes*, and *Pesukins*, they have also those of the *Christians*, or of the *Latin Bibles*, into Chapters and Verses; the *Keti Ketib*, or various Reading, *Latin* Summaries, *&c.* which make them of considerable Use, with Respect to the *Latin* Editions and the *Concordances*.

The *Bible* was translated into *Greek* by *Aquila*, under the Emperor *Adrian*; but that Version was very imperfect and full of Omissions. *Theodotion* published a new one in 189. *Theodotion* had been a Disciple of

Tatian; he followed *Marcion*, and from his School, paſſed to the Synagogue of the *Jews*, where he was received on Condition that he ſhould tranſlate the *Old Teſtament* into *Greek*, which he did with more Truth and Sincerity than *Aquila* had done, though there are many Additions and Omiſſions, which he has marked with a great deal of Care and Attention. The numerous Editions we have of the *Bible* in *Greek*, can all be reduced to three, *viz.* that of *Complutum*, or *Alcala de Henares*, that of *Venice*, and that of *Rome*. The firſt publiſhed in 1515 by Cardinal *Ximenes*, and inſerted in the *Polyglot Bible*, uſually called the *Complutenſian Bible*. This Edition is one of the beſt extant, and has been reprinted in the *Polyglot Bible* of *Antwerp*, in that of *Paris*, and in the 4to *Bible*, commonly called *Bible of Vatable*. The ſecond is that of *Venice* in 1518, reckoned full of Faults of the Copiſts, as having been printed juſt as it ſtood in the Manuſcript; it has been reprinted at *Straſburg*, *Baſil*, *Francfort*, and other Places. The beſt of them all is the Third, printed at *Rome*, in 1587, with *Greek Scholia*, collected from the Manuſcripts in the *Roman* Libraries, by *P. Morin*. This fine Edition has been reprinted at *Paris* in 1628, by *J. Morin*, Prieſt of the Oratory, who has added the *Latin* Tranſlation, which in the *Roman* was printed ſeparately, with *Scholia*. The *Greek* Edition of *Rome* has been printed in the *Polyglot Bible* of *London*; to which are added at Bottom the various Readings of the *Alexandrian* Manuſcript.

The *Latin Bibles* are alſo reduc'd to three Claſſes, *viz.* the antient *Vulgate*, tranſlated from the *Greek Septuagint*; the *modern Vulgate*, the greateſt Part of which is done from the *Hebrew* Text; and the new *Latin* Tranſlations, done alſo from the *Hebrew* Text in the ſixteenth Century.

The *antient Vulgate* is of very great Antiquity in the *Latin* Church, ſince it was the common, or vulgar Verſion, before St. *Jerome* made a new one, whence it is nam'd *Vulgate*. *Nobilius*, in 1588, and *F. Morin*, in 1628, gave new Editions of it, pretending to have reſtor'd and recollected it from the Antients who had cited it. The *Vulgate* was held by St. *Auguſtine* to be preferable to all the other *Latin* Verſions then extant; as rendering the Words and Senſe of the ſacred Text more cloſely and juſtly than any of the reſt. It has ſince been retouch'd from the Corrections of St. *Jerome*, and it is from this Mixture of the antient *Italick* Verſion, and ſome Corrections of St. *Jerom*, that it is now call'd the *Vulgate*, and which the Council of *Trent* has declar'd to be authentick. This *Vulgate* alone is us'd in the *Roman* Church, excepting ſome Paſſages of the antient *Vulgate*, left in the *Miſſal*, and the *Pſalms*; which are ſtill ſung according to the old *Italick* Verſion. Some Authors pretend, that we have nothing left of the *antient Vulgate* us'd in the primitive Times in the Weſtern Churches, but the *Pſalms*, *Wiſdom*, and *Eccleſiaſtes*.

We have, on the contrary, a conſiderable Number of Editions of the *modern Vulgate*. That inſerted by the Order of Cardinal *Ximenes*, in the *Bible* of *Complutum*, is one of the beſt, as well as that of *R. Stephens*, printed in 1540, and reprinted in 1545; in which are added, on the Margin, the various Readings of ſeveral *Latin* Manuſcripts, which he had conſulted. This Edition was revis'd afterwards by the Doctors of *Louvain*, who likewiſe added to it the various Readings of ſeveral *Latin* Manuſcripts.

The Correction of Pope *Clement* VIII, in 1592, is now the Standard of all the *Roman* Churches; from this the *Bibles* of *Plantin* were done, and from thoſe of *Plantin* all the reſt. The *Proteſtants* accuſe thoſe Editions of Pope *Clement*, with having ſome new Texts added, and many old ones alter'd, to countenance and confirm what they call the *Catholick Doctrine*; and the *Roman Catholicks* reproach the *Proteſtants* with the ſame Want of Sincerity; pretending, that what's alledg'd againſt them on that Subject, is a Calumny, forg'd with no other Deſign, than to render them ſuſpected to Perſons who otherwiſe would be very ready to eſpouſe their Doctrine: That they thought ſuch Falſhood had been clearly enough evidenc'd, in the famous, and for ever memorable Conference of *Fontainbleau*, between Cardinal *du Peron*, and *Pleſſis Mornay*; and by their Editions of the *Vulgate*, having been ſo often compar'd, by *Proteſtants* themſelves, with the moſt authentick original Manuſcripts.

In Anſwer to this, and to confirm the Charge laid againſt the *Roman Catholicks* of Infidelity, in the Editions of *Clement* VIII, they quote Father *Bebours*, who owns, that among the Differences that are found between the common *Greek* and the *Vulgate*, there are ſome wherein the *Greek* Reading appears more clear and natural than that of the *Latin*; ſo that the ſecond might be corrected from the firſt, if the holy See ſhould think fit. The *Catholicks* reply, that thoſe Differences, even in the Opinion of the beſt *Proteſtant* Authors, conſiſt only in a few Syllables, or Words that rarely touch the Senſe; the *Vulgate* being authoriz'd, in the moſt conſiderable Places, by ſeveral antient Manuſcripts, which, however, are not perhaps ſo correct as were thoſe with which the antient *Italic* or *Vulgate* Verſion was compar'd by St. *Jerom*. For as they were then nearer the Times of the *Apoſtles*, they might be ſuppos'd to have had juſter *Greek* Copies, and thoſe better kept, than any of thoſe us'd when Printing was firſt ſet on Foot.

There are great Numbers of *Latin Bibles*, of the third Claſs, comprehending the Verſions from the Originals of the ſacred *Books* made within theſe 200 Years. The firſt is that of *Santes Pagninus*, a *Dominican*, printed at *Lions*, in *Quarto*, in 1528; much eſteem'd by the *Jews*. This the Author improv'd in a *ſecond Edition*. In 1542, there was a beautiful Edition of the ſame at *Lyons*, in *Folio*; and *R. Stephens* reprinted it, with the *Vulgate*, in 1557. There is alſo another Edition of 1586, in *four Columns*, under the Name of *Vatable*. The Text of that of 1542, abovemention'd, with *Scholia*, by *Michael Servetus*, is ſuſpected by the *Roman Catholicks*, as being alter'd in ſeveral Places, as they pretend, on Purpoſe to favour the *Reformation*; as for the *Scholia*, they condemn them as heretical, ſchiſmatical, tending to *Hereſy*, &c. This ſame Verſion of *Pagninus*, corrected by *Arius Montanus*, having been approv'd by the Doctors of *Louvain*, was inſerted in the *Polyglot* of *Philip* II. and ſince in that of *London*; there have been various Editions of it in Folio, 4to, and 8vo, to which have been added the *Hebrew* Text of the *Old Teſtament*, and the *Greek*, of the *New*.

The *Samaritan Bible*, which admits no more for holy Scripture than the *Pentateuch*, or five Books of *Moſes*, being the moſt antient of all, deſerves alſo the firſt Rank. This Verſion has never been printed alone, nor any where but in the *Polyglots* of *London* and *Paris*. This *Samaritan Pentateuch* differs in ſome Reſpect from that of the *Jews*, and is written in different Characters, called *Samaritan Characters*; which *Origen*, St. *Jerome*, and other Fathers, and Criticks, antient and modern, take to be the primitive Characters of the antient *Hebrews*, though others maintain the contrary.

What we call *Chaldee Bibles*, are not properly a ſtrict Verſion of the Scriptures, but only Gloſſes and Paraphraſes upon it, which the *Jews* call *Targum*; for as during their long Captivity in *Babylon* they had forgot their antient Language the *Hebrew*, and now underſtood nothing but the Language of their Maſters, the *Chaldeans*, there was a Neceſſity of explaining the Prophets in that Language; and to this Neceſſity is owing the firſt Beginning of the *Chaldee Paraphraſe*, to make the Senſe of the Text underſtood. Each Doctor made a Paraphraſe of ſome Part thereof in the vulgar Tongue; and as theſe ſeveral Interpretations, in Time, became very voluminous, certain *Rabbins* undertook to collect them together, and this Collection they call the *Targum*. Though they do not agree about the Antiquity of the *Targum*; for the more modern *Jews*, having blended their own Comments,

ments, with thoſe of the Antients, no certain Age or Æra can be fixed for the whole Work.

It is commonly believed that *Rabbi Jonathan*, who lived under the Reign of *Herod* the great, made the firſt *Chaldee* Verſion of the Prophets; and with this Verſion mixed the Interpretations borrowed from Tradition. It is certain that *Onkelos* tranſlated the *Pentateuch* almoſt Word for Word, and without any Paraphraſe; but it is not equally certain, that *Jonathan* was the Author of the other Verſion of the *Pentateuch* aſcribed to him. We know little or nothing of the Authors of the Paraphraſe, or *Targum* on the other Books; no more than of thoſe of the *Targum* of *Jeruſalem*, which is another imperfect Paraphraſe on the five Books of *Moſes*; ſo that in Strictneſs the *Targum* of *Jonathan* and *Onkelos*, is the only Paraphraſe of any Authority. This is what *Scaliger* ſays in relation to it. The *Hebrew* was tranſlated under the Reign of *Tiberius* into *Chaldee*, by *Jonathan*; the Prophets by *Onkelos*; and the Books of *Moſes* into good old *Hieroſolymitan*, which was then uſed at *Jeruſalem*, much in the ſame Manner as *Latin* is among us. It is certain there was a *Targum Hieroſolymitanum*, ſtill extant: It was wrote in the vulgar Tongue, but that being then greatly corrupted, we have, now, much a-do to underſtand it. Thoſe *Targumiſts* might have ſeen *Jeſus Chriſt*; it is certain they lived long before the taking of *Jeruſalem*.

Widmanſtradius printed, at *Vienna*, in 1562, the whole *New Teſtament* in *Syriac*, in a beautiful Character: After him there were ſeveral other Editions; and it was inſerted in the *Bible* of *Philip* II. with a *Latin* Tranſlation. *Gabriel Sionita* alſo publiſhed a beautiful *Syriac* Edition of the *Pſalms* at *Paris*, in 1525, with a *Latin* Interpretation. The whole *Bible* is printed in *Syriac* in the *Polyglots* of *London* and *Paris*. In which two *Polyglots* there are alſo *Arabick* Verſions of the whole Scriptures, that of the *Old Teſtament* being attributed by ſome learned Men to *Saadias*; they give for Reaſon, that *Aben Ezra*, a great Antagoniſt of *Saadias*, quotes ſome Paſſages of his Verſion, which are the ſame with thoſe of the *Arabick* Verſion in the *Polyglots*; yet others are of Opinion that *Saadias*'s Verſion is not extant. *Juſtinian*, Biſhop of *Nebio*, printed at *Genoa* in 1516, an *Arabick* Verſion of the *Pſalter*, with the *Hebrew* Text and *Chaldee* Paraphraſe, adding *Latin* Interpretations. In 1672 there was printed at *Rome*, by Order of the Congregation *de propagandâ Fide*, an entire *Arabick* Edition of the *Old Teſtament*. The *Arabick* Verſion of the *Pentateuch*, of *Erpenices*, called alſo the *Pentateuch* of *Mauritania*, as being made by the *Jews* of *Barbary*, and for their Uſe, is eſteemed literal, and very exact; as well as the four Evangeliſts, publiſhed at *Rome* in *Arabick*, with a *Latin* Verſion, in 1591; which have been ſince reprinted in the *Polyglots* of *London* and *Paris*. We have ſeveral authentick Manuſcript Copies of the *Bible* in *Coptick* in the great Libraries, eſpecially that of the King of *France*.

The *Æthiopians* have alſo tranſlated the *Bible* in their Language; of which we have a very accurate *New Teſtament*, printed at *Rome* in 1548, though found Fault with by thoſe, who diſcover ſomething in it, which riſes in Judgment againſt them. The ſame has been reprinted in the *Engliſh Polyglot*, as well as the *Pſalms*, *Canticles*, ſome Chapters of *Geneſis*, *Ruth*, *Joel*, *Jonah*, *Zephaniah*, and *Malachi*, all in the ſame Language.

Some of the *Armenian* Doctors about the Time of St. *Chryſoſtom*, made an *Armenian* Verſion of the *Bible* from the *Greek* of the *Seventy*, which was firſt printed entire in 4to at *Amſterdam*, in 1664, by one of their Biſhops, with the *New Teſtament* in 8vo.

The *Perſian Pentateuch*, printed in the *London Polyglot*, is the Work of *Rabbi Jacob*, a *Perſian Jew*; but we have nothing now remaining of that antient *Perſian* Verſion of the old *Bible*, mentioned by ſome of the Fathers. There was alſo a Verſion made of the whole *Bible* (the Book of *Kings* excepted) into *Gothick*, by *Aphilas*, a *Gothick* Biſhop; the four Evangeliſts were printed in 4to at *Dort*, from an antient Manuſcript in 1665; having nothing elſe remaining of that Verſion. The Reaſon given for *Aphilas* omitting the Book of *Kings* is, his being afraid that the frequent Mention of the Wars therein ſhould inſpire too much of the military Genius into his Countrymen.

Con. Baſil, Duke of *Oſtravia*, had an entire *Bible* in the *Sclavonick* Tongue, printed at *Oſtravia*, in *Volhinia*, in the Year 1581, at his own Expence, for the common Service of all Chriſtians, who ſpeak the *Sclavonick* Language, whereof the *Muſcovitiſh* is a Dialect, for which Reaſon this Verſion is commonly called the *Muſcovite Bible*.

It would be endleſs to rehearſe here the vaſt Number of Verſions of the *Bibles* in other vulgar Tongues, as *Engliſh*, *French*, *German*, *Spaniſh*, *Italian*, *Dutch*, &c. ſince we have ſo many Catalogues of them in ſeveral Authors. Therefore I conclude this Detail of the ſeveral Verſions of the *Bible*, by explaining what is meant by *Polyglot*, which I have ſo often mentioned.

POLYGLOT, from the *Greek* πολυ, many, and γλωτλα, Language, denotes a *Bible*, printed in ſeveral Languages. *Ximenes de Cineros*, Cardinal and Archbiſhop of *Toledo*, conſidering that no Tranſlation, ever ſo exact and perfect, can render the true Senſe of the Scriptures, judged proper to give them in their Original, and therefore had the firſt *Polyglot Bible* printed at *Alcala de Henares* 1515, which contains the *Hebrew* Text, the *Chaldee* Paraphraſe, or *Targum*, on the *Pentateuch*, the *Greek* Verſion of the *Septuagint*; and the antient *Latin* Verſion. This *Bible* is called *Complutenſian Bible*; at the End whereof is added an *Apparatus* of Grammars, Dictionaries, and Indexes or Tables.

The Second *Polyglot* was printed at *Antwerp* in 1572, by *Plantin*, under the Direction of *Arius Montanus*. 'Tis called the *Polyglot* of *Philip* II. as being publiſhed by his Order; and contains, beſides what's in the *Bible* of *Complutum*, the *Chaldee* Paraphraſes on the Reſt of the *Old Teſtament*, with a *Latin* Tranſlation of them. A literal *Latin* Verſion of the *Hebrew* Text. An *Hebrew* and *Syriac* Verſion, both in *Syriac* and *Hebrew* Characters, with Points to it of the *New Teſtament*. *Guy le Fevre*, who had the Care of the *Syriack* Verſion, having added a *Latin* one to it, and a new *Apparatus* of Dictionaries, Grammars, &c. with ſeveral little Treatiſes, neceſſary for clearing up the more difficult Paſſages in the Text.

M. *Le Jay*'s *Polyglot* (which is the third) printed at *Paris* in 1645, beſides the Beauty of the Characters, which are magnificent, and the Size of the Paper, has this other Advantage over that of *Antwerp*, of having the *Syriack* and *Arabick* Verſions of the *Old Teſtament* with *Latin* Interpretations. It has likewiſe in the *Pentateuch*, the *Hebrew* and *Samaritan* Text; and the *Samaritan* Verſion, in *Samaritan* Characters; beſides an *Arabick* Tranſlation of the *New Teſtament*, with a *Latin* Interpretation: But it wants, to render it perfect, the Grammars and Dictionaries, which are in both the former *Polyglots*.

In Dr. *Brian Walton*'s *Polyglot*, printed in 1657, the *Vulgate* is printed according to the reviſed and corrected Verſion of *Clement* VIII. and it contains, beſides, an interlineary *Latin* Verſion of the *Hebrew* Text, the *Greek* Text of the *Septuagint* of the Edition of *Rome*, and the *Latin* Verſion of the ſame Text, publiſhed by *Flaminius*, by Authority of Pope *Sixtus* V. beſides ſome Parts of the *Bible* in the *Ethiopick* and *Perſian*; and ſome Preliminary Diſcourſes, or *Prolegomena*, on the Text, both of the Originals and Verſions.

The two *Pentateuchs* printed by the *Jews* of *Conſtantinople*, in four Languages, but all in *Hebrew* Characters; might be alſo numbered among the *Polyglots*. One of theſe *Pentateuchs*, printed in 1551, contains the *Hebrew* Text in large Characters; on one Side whereof is the *Chaldee* Paraphraſe of *Onkelos*, in middling

middling Characters; and on the other a Paraphraſe in the *Perſian*, compoſed by *Jacob de Tous*, a *Jew*. A Top of the Pages is printed, in ſmall Characters, the *Arabick* Paraphraſe of *Saadias*; and at Bottom the Commentary of *Raſch*. The other printed likewiſe at *Conſtantinople*, like the former in 1547, has the *Hebrew* Text of the Law in the Middle; a Tranſlation into the vulgar *Greek* on one Side, and a *Spaniſh* Tranſlation on the other, with the *Chaldee* Paraphraſe of *Onkelos* at the Top of the Page, and the Commentaries of *Raſch* at Bottom. The *Hexapla*, and *Octapla* of *Origen*, might be ranged likewiſe under the Article of *Polyglots*.

The HEXAPLA, is an Edition of ſix Verſions of the Bible diſpoſed in ſix Columns, by *Origen*, after he had quitted *Alexandria*, and retired to *Tyre* in 228, a Work very much admired by St. *Epiphanius* and St. *Jerome*. The ſixth Verſion had been found a Year before in the City of *Nicopolis*, without the Name of an Author, no more than the fifth. What engaged *Origen* to undertake this Work, was that having frequent Diſputations with the *Jews*, in *Egypt* and *Paleſtine*, and obſerving that they always objected againſt thoſe Paſſages of the Scripture quoted againſt them, and appealed to the *Hebrew* Text; the better to vindicate thoſe Paſſages, and confound the *Jews*, by ſhewing that the *Seventy* had given the Senſe of the *Hebrew*, or rather to ſhew, by a Number of different Verſions, what the real Senſe of the *Hebrew* was; he undertook to reduce all theſe ſeveral Verſions into a Body, which he called Εξαπλα, *Hexapla*, *Sextuple*, Work of ſix Columns. Taking great Care to correct the Changes and Additions, the *Jews* and the *Chriſtians*, and *Theodotion* among the reſt, had made in the Verſion of the *Septuagint*; but as his Marks were eaſily omitted by thoſe who tranſcribed ſo prolix a Work, Confuſion and Corruption were introduced into it a-new; which was the Cauſe that the Martyr *Lucian*, *Heſychius*, and St. *Jerome*, applied themſelves ſucceſſively to reſtore it to its priſtine Purity. This celebrated Work of *Origen* periſhed long ago; tho' ſeveral of the antient Writers have preſerved Pieces thereof, particularly St. *Chryſoſtom* on the *Pſalms*, *Philoponus* in his *Hexameron*, *&c.* ſome modern Writers have endeavoured to collect Fragments of the *Hexapla*, particularly *Druſius*, and *F. Montfaucon*.

St. *Epiphanius* calls alſo this Work *Octapla*, from the *Greek* οκτω, *Eight*, becauſe conſiſting of eight Columns. In the firſt was the *Hebrew* Text in *Hebrew* Characters; in the ſecond the ſame Text in *Greek* Characters; in the third, the *Greek* Verſion of *Aquila*; in the fourth that of *Symmachus*; in the fifth the *Septuagint*; in the ſixth that of *Theodotion*, in the ſeventh that called the *fifth*; the laſt was that called the *ſixth*.

The Books of the *Bible* have not always been of an equal Authority. St. *Jerome* aſſures us that the antient Canon, or Catalogue of the Books of the *Old Teſtament*, made by the *Jews* under *Eſdras*, in a great Aſſembly of their Doctors, which they call by Way of Eminence, *the great Synagogue*, conſiſted of no more than twenty-two Books; though it is pretended by ſome Authors, that the *Jews* themſelves agree that they put Books therein, which had not been ſo before the *Babyloniſh* Captivity; ſuch are thoſe of *Daniel*, *Ezekiel*, *Haggai*, and thoſe of *Eſdras* and *Nehemiah*. This is the Canon, according to that Father which was followed by the primitive Church, 'till the Council of *Carthage*, in 535, under the Emperor *Juſtinian*, who enlarged it conſiderably, taking into it the Books which Proteſtants call *Apocryphal*, which Canon has been further enlarged by the Council of *Trent*, though a great Number of other Authors are of a contrary Sentiment, and pretend that the Canon of the Council of *Trent*, is the ſame with that of the Council of *Hippo* held in 393; and with that of the third Council of *Carthage*, at which were preſent forty-ſeven Biſhops, and among the reſt St. *Auguſtin*, who declared they received it from their Fathers.

The *Roman Catholicks*, to ſupport the Authority and Credit of the Council of *Trent*, on this Subject, pretend, that the Decree of that Council, with Reſpect to the canonical *Books*, was made in Conſequence of the firſt Reformers having rejected all thoſe *Books* of the Scripture which contain'd any Thing contrary to their *Dogma's*; as *Judith*, *Tobit*, the *Maccabees*, *Eſdras*, &c. That the *Proteſtants*, conſidering that it was impoſſible to give to ſome Paſſages found in thoſe *Books* which ſupport the Doctrine of the Invocation of Angels, of the Prayers for the Dead, of the Merit of good Works, *&c.* than the real and genuine one, they thought fit to reject thoſe *Books* as apocryphal, whoſe Authority, if they were continu'd to be conſider'd as canonical, would be always a Stumbling-block in their Way. M. *Simon* contends, in Favour of thoſe *Books*, rejected as apocryphal by the *Proteſtants*, that they muſt have been read in *Greek*, even by the Apoſtles themſelves; which he infers from divers Paſſages in their Writings. He adds, that the Church receiv'd them with the other *Books* of Scripture, from the *Helleniſt Jews*; and that if the Churches of *Paleſtine* never admitted them, it was not for their accounting them *apocryphal*, in the Senſe the Word is now us'd, but becauſe they read none but what were writ in *Hebrew*. To this Reaſoning of M. *Simon*, the *Proteſtants* oppoſe the Authority of ſeveral Writers, both antient and modern, to which the *Roman Catholicks*, on their Side, oppoſe that of ſeveral others, together with the conſtant Practice of the Church, as they pretend.

Voſſius obſerves, that, with Regard to the ſacred *Books*, none are to be accounted apocryphal, except ſuch as have neither been admitted into the Synagogue, nor the Church, ſo as to be added to the Canon, and read in Publick: For this Reaſon, the *Books* of the *Sybils* were antiently call'd *apocryphal*, as being committed to the Truſt of the *Decemviri*, alone; and for the like Reaſon, the Annals of the *Egyptians* and *Tyrians* were call'd by the ſame Name. Before the *Septuagint* Verſion, the *Books* of the *Old Teſtament* were all apocryphal, in the original Meaning of the Word, which was, that all the Writings depoſited in the Temple were call'd *apocryphal*, by reaſon they were kept ſecret from the People: For when the *Jews* publiſh'd their ſacred *Books*, they only gave the Appellation of canonical and divine to ſuch as they thus made publick; and call'd *apocryphal* ſuch as were ſtill retain'd in their Archives, becauſe not made publick. But in Proceſs of Time the Senſe of the Word was chang'd, and thoſe *Books* alone were call'd *apocryphal*, which were of doubtful or ſuſpected Authority, which has continu'd ever ſince.

Some of the Fathers have, beſides, diſtinguiſh'd the ſacred Writings into *Proto-canonical*, and *Deutero-canonical*. The *Proto-canonical*, are thoſe whoſe Authority has never been ſuſpected; and the *Deutero-canonical* thoſe, whoſe Canonicity was doubtful; for which Reaſon, they were added to the Canon after the reſt. The *Deutero-canonical Books* in the modern Canon, are the Books of *Eſther*, either the whole, or at leaſt the ſeven laſt Chapters thereof; the Epiſtle to the *Hebrews*; that of *James*; and that of *Jude*; the ſecond of St. *Peter*; the ſecond and third of St. *John*; and the *Revelations*. The *Deutero-canonical* Parts of *Books*, are, in *Daniel*, the Hymn of the *three Children*; the *Prayer of* Azariah; the Hiſtories of *Suſannah*, of *Bel* and the *Dragon*; the laſt Chapter of St. *Mark*; the bloody Sweat, and the Appearance of the Angel, related in St. *Luke*, Chap. xxii. and the Hiſtory of the adulterous Woman in St. *John*, Chap. viii.

Among the *canonical Books* of the *Old Teſtament*, the *Pentateuch*, or five Books of *Moſes*, viz. *Geneſis*, *Exodus*, *Leviticus*, *Numbers*, and *Deuteronomy*, are the firſt in Order, as being, likewiſe, the firſt for Antiquity, ſince there is no authentick Account of any other *Book*, either ſacred, or profane, having been written before them. The whole *Pentateuch* is attributed to *Moſes*, as Author thereof; though Father *Simon*,

Symon, in his critical Hiſtory of the *Old Teſtament*, produces ſeveral Paſſages to prove that the Legiſlator of the *Jews* was not wholly the Author of the *Pentateuch*, as we now have it; which Sentiment is very well ſupported by the Interpolations at the End of the *Pentateuch*; ſince it is abſurd to ſuppoſe *Moſes* the Author of the Account of his own Death and Burial, and of the Compariſon between him and the ſucceeding Prophets in *Iſrael*. *Eſdras* is thought the Author of the interpolated Paſſages, being ſuppos'd to have publiſh'd the *Old Teſtament*, or at leaſt a Part of it, corrected, and enlarg'd, on his Return from the *Babyloniſh* Captivity.

The *Jewiſh*, or *Hebrew Pentateuch*, wrote in the *Chaldean*, or *Aſſyrian* Character; and that of the *Samaritans*, wrote in the *Samaritan*, or *Phœnician* Character, have a long Time diſputed the Preference, both as to Antiquity, and as to Character; both maintaining theirs to be the antient *Hebrew*. *Simon Allix*, and many other learned Men, abide by the former, pretending, that the *Chaldean* and *Syrian* Characters have been always in Uſe among the *Jews*; and the *Samaritan*, or *Canaaniti ſh*, to have never been us'd by the *Jews* before the Captivity, in any Manner, either in *Books*, or on Medals. *Uſher* is of the ſame Sentiment, and takes the *Samaritan Pentateuch* to have been compil'd by *Doſitheus*, a *Samaritan*, mention'd by *Origen* to have adulterated the *Pentateuch*. *Du Pin* ſuppoſes it the Work of ſome modern *Samaritan*, whom he imagines to have compil'd it chiefly out of the different Copies of the *Paleſtinian* and *Babylonian Jews*, and the *Septuagint*; becauſe it ſometimes agrees with one, and ſometimes with another. *Prideaux* believes it a Tranſcript out of the *Chaldean* into the old *Hebrew* Character, giving for Reaſon, that there are many Variations in the *Samaritan*, manifeſtly occaſion'd by miſtaking the ſimilar Letters in the *Hebrew* Alphabet; which Letters having no Similitude in the *Samaritan* Character, it is evident the Variations muſt have ariſen in tranſcribing from the vulgar *Hebrew* into *Samaritan*.

Mr. *Whiſton* declares in Favour of the *Samaritan Pentateuch*, and aſſures it to be an uncorrupted Copy of the *Books* of *Moſes*, originally deriv'd from the firſt Separation of the ten Tribes themſelves, in the Days of *Jeroboam*; though the contrary be apparent, from the mere confeſs'd Interpolations aſcrib'd to *Eſdras*, who liv'd ſeveral hundred Years after the Time of *Jeroboam*; and from one or two more interpolated Paſſages in the *Samaritan*, than the *Hebrew Pentateuch*; the firſt of which is in *Deuteronomy*, Chap. xxvii. Ver. 4. where an Altar is enjoin'd to be built, and Sacrifices to be offer'd on Mount *Gerizzim*, or *Ebal*; which Paſſage was, doubtleſs, foiſted in to countenance the *Samaritan* Worſhip, and repreſent it with equal Antiquity with that of the Temple of *Jeruſalem*.

At the Head of the *Pentateuch* ſtands the *Book* of *Geneſis*, which the *Hebrews* call *Bereſchith*, becauſe it begins with that Word, which in their Language ſignifies *in Principio*, in the Beginning; and the *Greeks Geneſis*, Γενεσις, Production, Generation; becauſe it begins with the Hiſtory of the Production and Generation of all Beings. *Moſes* is thought to be the Author of the *Geneſis*, and it contains the Relation of 2367 Years, *viz.* from the Beginning of the World to the Death of *Joſeph*. The *Jews* are forbid to read the Beginning of *Geneſis*, and the Beginning of *Ezekiel*, before thirty Years of Age. *Cedrenus* makes mention of an *apocryphal Book*, entitled, the *Little Geneſis*, *Geneſis parva*; containing ſeveral Incidents, not in the other, ſome of which he has preſerv'd; particularly, that *Cain* was buried under the Ruins of a Houſe; that an Angel taught *Abraham* the *Hebrew* Tongue; that *Maſtiphat*, Prince of the Devils, adviſ'd God to order *Abraham* to ſacrifice his Son, for a Trial of his Obedience; that the Children of *Iſrael* were only caſt into the *Nile* for ten Months, *&c.*

The *Exodus*, by the *Hebrews* call'd *veelle Semoth*, *hæc nomina*, theſe are the Names; which are the initial Words of the *Book*; and by the *Greeks* Εξοδος, which literally imports a *going out*, or *Journey*, becauſe the Hiſtory of the *Iſraelites* Paſſage out of *Egypt* is related therein. The *Exodus* contains, beſides, the Story of what was tranſacted in *Egypt*, from the Death of *Joſeph* to the Delivery of the *Jews*; as well as what paſs'd in the Wilderneſs, and particularly at Mount *Sinai*, to the building of the Tabernacle.

The *Leviticus*, call'd by the *Jews*, *vajickra*; and the *Numbers*, *vajiedabber*; contain nothing elſe but the ceremonial and other Laws; and the *Deuteronomy*, *Elleh haddebarim*, is a Repetition, or Recapitulation of the Law, which *Moſes* had before deliver'd them at large. And hence *Deuteronomy* is ſtill call'd, by the *Rabbins*, *Repetition*. They likewiſe call it, *the Book of Reprimands*, on account of the 28th Chapter, which is full of Bleſſings promis'd to ſuch as keep the Law, and of Curſes threaten'd to ſuch as tranſgreſs it. It is pretended, that *Deuteronomy* was written the fortieth Year after the Delivery from *Egypt*, in the Country of the *Moabites*, beyond *Jordan*; *Moſes* being then in the 120th Year of his Age. It contains in *Hebrew* eleven Paraſches, though only ten in the Edition of the *Rabbins* at *Venice*; twenty Chapters, and 955 Verſes. In the *Greek*, *Latin*, and other Verſions, it contains 34 Chapters. The laſt is not of *Moſes*; ſome ſay it was added by *Joſhua*, immediately after *Moſes*'s Death, which is the moſt probable Opinion. It was the *Greeks*, when they firſt tranſlated the Law, that gave the five Parts, into which it was divided, the Name of *Geneſis*, *Exodus*, *Leviticus*, *Numbers*, and *Deuteronomy*, which is the Reaſon why all theſe Names are *Greek*, except the *Leviticus*, which is *Hebrew*; for it does not appear that *Moſes* made any Diviſion of what he wrote, into *Books*; or that he gave different Names and Titles to the different Parts of his Work: Nor do the *Jews*, even at this Day, diſtinguiſh them in the Copies they uſe in the Synagogues; but write them all running as one ſingle Work, without any other Diſtinction beſide that of little and great Paraſches; though in other Copies, us'd by private Perſons, they are divided into five Parts, as among us; but they give them no other Name, but the firſt Word wherewith each Diviſion begins; much as we do in quoting a Decree, or Chapter of the Canon Law.

Joſhua is the next in Order of the *canonical Books* of the *Old Teſtament*, and contains what happen'd to the *Iſraelites* under the Conduct of that famous General *Joſhua*, whom *Moſes* had appointed for his Succeſſor in the Government of the People. The Author of this *Book* is not known, no more than that of the following, call'd the *Judges*, which is a Collection of ſeveral little Hiſtories, which at firſt were ſeparate, but were afterwards collected by *Eſdras*, or *Samuel*, into a ſingle Volume; and, in all Likelihood, were taken from the antient Journals, Annals, or Memoirs, compos'd by the ſeveral Judges.

The Canonicity of the *Book* of *Job* has been very much diſputed among the learned Divines; neither can they agree, as to the Author of that *Book*; though the moſt common Opinion is, that *Moſes* publiſh'd that Work during the Captivity of the *Iſraelites* in *Egypt*, to give them an Example of Patience in their Miſeries. The great Erudition which appears throughout the whole, is certainly worthy that great Man who had been inſtructed in all the Sciences of the *Egyptians*; but the Learned in the *Hebraick* Tongue pretend, that there are ſeveral Terms in it which were not in Uſe till after *David*; and that it is full of Phraſes of the *Idumean* Language; which makes them conjecture, that the Author who compos'd it was of that Country. *Codruſt*, a Perſon very well vers'd in the Oriental Tongues, is inclin'd to believe, that *Iſaiah* could very well be the Author of it, from the Report he finds between the Style of the *Book* of *Job* and that of the Prophet. Some have believ'd, that there has never been ſuch a Man as *Job*; that the Author of the *Book* which goes under his Name, had in-

vented the Subject; but that Sentiment is condemn'd by the Prophet *Ezekiel*, who mentions *Job* with *Noah*; and by St. *James*, in his Epiſtle, Chap. v. who propoſes him to the *Chriſtians* as a Model of Patience they are to follow, when perſecuted for the Faith. *Job* was Grandſon of *Eſau*, born, according to Father *Petau*, 232 Years before the Deliverance of the *Iſraelites* from their Captivity in *Egypt*, and 1763 before the Birth of our Saviour. *Torniel*, *Sponde*, and ſome other modern Authors, ſay, after ſome of the Antients, that *Job* was 71 Years old, when his Calamities happ.n'd to him, which ſome of them will have to have laſted ſeven Years, and others one Year only; but to ſay the Truth, I believe no Body knows any Thing of it. The Scripture ſays expreſly, that he liv'd 140 Years after his Calamities; which added to 71, makes 211 Years.

Sixteen *Prophets* are rank'd among the *canonical Books*, four *greater*, ſo call'd from the Length, or Extent of their Writings; and twelve *leſſer*, from the Shortneſs of their Writings. The *greater Prophets* are, *Iſaiah*, *Jeremiah*, *Ezekiel*, and *Daniel*; and the *leſſer*, *Hoſea*, *Joel*, *Amos*, *Obadiah*, *Jonah*, *Micah*, *Nahum*, *Habakkuk*, *Zephaniah*, *Haggai*, *Zechariah*, and *Malachi*. In the *Greek* Church the *leſſer Prophets* are plac'd in Order before the great ones, apparently becauſe many of the *leſſer Prophets* are more antient than the *greater*. The *Greeks*, alſo, as well as the *Jews*, rank'd *Daniel* among the *leſſer Prophets*; the *Jews* pretending that he is no more to be rank'd among the *Prophets* than *David*: Not but that both the one and the other foretold many important Things, but becauſe their Manner of Life differ'd from that of the other *Prophets*. *Spinoza* ſays, that ſeveral *Prophets* propheſy'd according to their reſpective Humours; *Jeremiah*, for Example, melancholy and dejected with the Miſeries of Life, propheſy'd nothing but Misfortunes. *Dacier* obſerves, that among the Antients the Name *Poet* is ſometimes given to *Prophets*; as that of *Prophet* is at other Times given to *Poets*.

The *canonical Books* of the *New Teſtament*, are the *four Evangeliſts*, the *Apocalypſe*, or *Revelations*, the *Acts of the Apoſtles*, and the *Epiſtles of St.* Paul, *St.* Peter, *St.* Jude, *and St.* James.

Among the four Evangeliſts, the Goſpel of St. *Matthew* is plac'd the firſt. He wrote it in *Hebrew*, (*Anno Chriſt.* 41. and the third of the Emperor *Caligula*) for the Inſtruction of the *Jews* who believ'd in *Chriſt*, the Actions of whoſe Humanity are particularly deſcrib'd therein; it is for that Reaſon, that St. *Matthew* is repreſented, among the four Evangeliſts, under the Figure of a Man. His Goſpel was ſo much eſteem'd, from the Time of its Publication, that St. *Barnabas* us'd to carry always a Copy of it along with him in all his Travels, with which he was buried, and which was found on his Stomach when the Place of his Sepulchre was diſcover'd under the Emperor *Zeno*. The *Nazarenes* kept it a long while without making any Alteration in it; and it was from them St. *Jerome* had a Copy of it, in order to tranſlate it into *Latin*. But in Proceſs of Time it was corrupted, as well by the *Nazarenes*, as by the *Ebionites*, the *Cerinthians*, and *Carpocratians*, who took Occaſion from the human Genealogy deſcrib'd therein, to deny the Divinity of *Chriſt*. St. *Jerome* ſays, that in his Time the *Hebrew* Original was kept in the Library of *Ceſarea*.

St. *Mark* wrote his Goſpel by St. *Peter*'s Order, who had took a particular Care to inform him of the Actions and Miracles of *Jeſus Chriſt*. *Tertullian* ſays, that in his Time it was call'd the *Goſpel of St.* Peter. It is an Abridgment of that of St. *Matthew*. St. *Jerome*, St. *Auguſtine*, and St. *Chryſoſtome*, are of Opinion, that the Original is *Greek*; and Cardinal *Baronius*, that St. *Mark* writing the Hiſtory of *Chriſt* for the Uſe of the *Romans*, he muſt have done it in a Language they underſtood; and that in ſeveral Places of his Goſpel there are Locutions entirely *Latin*; perhaps while St. *Mark* was at *Aquileia*, (if we believe an old Tradition which is not warranted by good Authors) he tranſlated into *Greek* the Goſpel he had wrote in *Latin*. At *Rome*, the *Greek* Tongue was very common, ſince St. *Paul* wrote to the *Fideles* in that Language; but *Suetonius* aſſures us, that it had been much diſcredited by the Emperor *Claudius*, in whoſe Time St. *Mark* wrote.

St. *Luke*'s Goſpel was wrote againſt the Errors of ſeveral Hereticks, which, himſelf ſays at the Beginning, was the Occaſion of his writing it; and that he has learn'd the Things he is a going to recount, from thoſe who had ſeen them, and who had been the firſt Miniſters of the Word, meaning the Apoſtles, and St. *Paul* in particular, to whom he had been given, by the Churches, for a Companion of his Travels. He mentions ſeveral Things, in his Goſpel, of the Birth, Predication, and Miracles of *Chriſt*, which the other Evangeliſts ſay nothing of; even his Style is more elegant than theirs.

St. *John* wrote his at the Intreaty of the Biſhops of the Oriental Church, to refute the Errors of *Ebion* and *Cerinthus*.

St. *Luke* is the Author of the *Acts of the Apoſtles*. The principal Deſign of this Work, is the Hiſtory of St. *Paul*, though he has omitted ſeveral of the moſt important Actions of that Apoſtle, which we find in his Epiſtles.

The Epiſtle of St. *Paul* to the *Romans*, which is the firſt in Order, was wrote at *Cenchrea*, the Port of *Corinth*. This Epiſtle contains the fundamental Truths of the *Chriſtian* Religion, the Corruption of human Nature by *Adam*'s Sin, the Reparation by the Grace of *Chriſt*, the Efficacy of that Remedy, the Secret of his eternal Election, which he founds entirely on the Will of God, who, of the ſame Maſs of Corruption, forms Veſſels of Honour, and Veſſels of Ignominy, without having the leaſt Right to aſk him the Reaſon of that Difference. He propoſes to himſelf all the Objections which human Pride can make againſt that Choice, but inſtead of reſolving them, he has Recourſe to the Unſcrutability of God's Judgments, which are to be reſpected by Mankind with Humility, without attempting to fathom them with Pride, as if the Creator owed ſomething to thoſe who are all born in the ſame Condemnation, by the original Sin, and might, without Injuſtice, be left in it.

The Apoſtle wrote the firſt Epiſtle *to the Corinthians* at *Epheſus*; and at *Rome* thoſe to the *Epheſians*, *Philippians*, *Coloſſians*, the ſecond Epiſtle to *Timothy*, and the famous Epiſtle to the *Hebrews*; wherein, by the divine Explication of the Prieſthood of *Chriſt*, he ſhews his profound Erudition in the Law of *Moſes*, as well as in the ſublime Truths of the Goſpel. This Epiſtle has been a Subject of great Controverſy among the Learned, who could not agree as to the Author thereof, nor underſtand the *Sacrifice* mention'd therein. From *Macedon* he wrote the firſt to *Timothy*.

The antient Fathers have been long divided about the *Apocalypſe*, a Book as cloſe as that with ſeven Seals mention'd therein; and, in my Opinion, the Interpreters cannot flatter themſelves with any Hope of Succeſs in their Deſign of interpreting it: For, who knows if the greateſt Part of the Prophecies it contains have not happen'd in the firſt Perſecutions of the Church, or if they all relate to what will happen at the End of the World under the true *Antichriſt*? The antient Fathers, both *Greeks* and *Latins*, have receiv'd this *Book* for *canonical*, though attributed to another *John*. St. *Jerome* ſays, that, in his Time, the *Greek* Churches queſtion'd if it had been wrote by St. *John* the Evangeliſt. St. *Baſil*, and *Gregory Nazianzen*, abſolutely rejected it, and the Council of *Laodicea* never mention it in their Canon of the ſacred Writings. *Dionyſius Alexandrinus* cenſures it as written in bad *Greek*, and even finds Soleciſms and Barbariſms in it, in abundance; though he allows it to contain a myſtick Senſe, which, he ſays, he admires, even where he does not underſtand it.

On the other Hand, St. *Juſtin*, *Irenæus*, *Theophilus Antiochenus*, *Melito*, *Apollonius*, *Clemens Alexandrinus*,

nus, and *Tertullian*, make no doubt of its being canonical. The third Council of *Carthage* held in 397, placed it in the Canon of the *New Teſtament*; and the Churches both of the Eaſt and Weſt have acknowledged it ever ſince. The *Alogians* are repreſented by Eccleſiaſtical Writers, as great Declaimers againſt the *Apocalypſe*, many of the Flights whereof they turn into Ridicule; particularly the Viſions of the ſeven Trumpets, the four Angels bound on the River *Euphrates*, &c. St. *Epiphanius* defends it againſt them; the *Book*, he obſerves, is not a meer Hiſtory, but a Prophecy, ſo that it is no wonder the Author ſhould expreſs himſelf after the Manner of the Prophets, whoſe Stile is uſually figurative. Of all their Objections againſt the Authority of this Book, that ſeems the beſt grounded, which is drawn from thoſe Words, *c.* 2. *v.* 18. *write to the Angel of the Church of* Thyatira; there was not, ſay they, any *Chriſtian* Church at *Thyatira* at that Time. St. *Epiphanius*, who grants them this Point, is forced to have Recourſe to the Prophetick Spirit, as if St. *John* had foreſeen there would be a Church there in Courſe of Time. Several orthodox Writers have rejected the *Apocalypſe*, as countenancing the Reveries of *Cerinthus* touching the carnal Reign of *Chriſt* on Earth.

In the firſt Century of the Church, there were a great many other Books attributed to the Apoſtles, *viz.* the Acts, Goſpel, Apocalypſe, and Judgment of St. *Peter*. The Goſpel and Apocalypſe of St. *Paul*; his Raviſhment to Heaven, forged by the *Cainites*; his Acts; a third Epiſtle to the *Corinthians*, and to the *Theſſalonians*, and one to thoſe of *Laodicea*. A new Apocalypſe was attributed to St. *John*; *Cerinthus* being ſuſpected to have been the Author thereof. St. *Thomas*, St. *Bartholomew*, St. *James the Minor*, St. *Matthias*, St. *Thadee*, and St. *Barnabas*, were preſented with each his Goſpel. *Chriſt* himſelf was not ſpared by the Impoſtors of thoſe Times, for under his Name was publiſhed a Book entituled, *of the Magick Art*, addreſſed to St. *Peter* and to St. *Paul*.

The Scriptures, both the *Old* and *New Teſtament*, are ſo full of intricate and obſcure Paſſages, difficult to be underſtood, and of ſo many ſeeming Contradictions; that there have always been Interpreters in both the *Jewiſh* and *Chriſtian* Church, to explain thoſe Difficulties, and to reconcile thoſe apparent Contradictions; whoſe Works might be conſidered as divine Books, ſince they contain our Theology, Moral, Politick, and Œconomy in clearer Terms than the Scripture itſelf; for it is monſtrous to ſuppoſe, that every ignorant Man, who often has not Senſe enough to guide himſelf in the moſt common Occurrences of Life, is capable of interpreting the Scripture. Such Doctrine is capable to cauſe nothing elſe but Diſorder and Confuſion in the Church, which had never been infected with the Venom of Hereſies and Schiſms, if Perſons infatuated with their own pretended Merit, to make themſelves Chiefs of Party, and Enthuſiaſts, had not had the ſacrilegious Preſumption (to ſerve their own Purpoſes) to give what Senſe they pleaſed to the Scripture. The moſt eſteemed modern Interpreters of the Scriptures among the *Roman Catholicks*, are *Maldonatus* and *Cornelius a Lapide*.

Among divine *Books* are alſo to be ranked, the Writings of the Fathers, in the different Ages of the Church; of which I'll give here a ſhort Catalogue.

We have nothing left of what was written in the firſt Century, in Defence of the *Chriſtian* Religion, neither are we certain that any Thing was wrote at that Time on that Subject; the ſame cannot be ſaid of the ſecond Century, which produced ſeveral eminent Perſonages, who, not contented with witneſſing their Faith, by their Courage and Conſtancy, in the Perſecution, left alſo behind them ſeveral other immortal Monuments of it. The firſt of thoſe invincible Champions of Chriſtianity, is *Clement*, Biſhop of *Rome*, who had been Diſciple of St. *Peter*; and ſuffered Martyrdom, under the Emperor *Trajan*, *Ann.* 102. We have yet extant ſeveral Works under his Name, eſpecially his firſt Epiſtle to the *Corinthians*, which an *Engliſhman* publiſhed towards the Middle of the laſt Century, and who ſays he had found it in the King of *England*'s Library. This Epiſtle is ſome Time mentioned by the antient Fathers, eſpecially by St. *Jerome*, *l. de Script. Eccleſ. in Clem.* and it bears ſome Character of Antiquity. As for his ſecond to the ſame *Corinthians*, 'tis loſt, and had never been much approved by the Church. The Falſity of that written to St. *James*, appears, by that it being made mention in it of the Death of St. *Peter*, which happened ſeveral Years after that of St. *Clement*. St. *Epiphanius* ſpeaks of ſeveral others of his Letters, ſent to all the Biſhops, wherein he recommends Celibacy, and St. *Jerome* quotes them againſt *Jovinian*. In his Conſtitutions there are ſeveral Errors inſerted by the Hereticks, and for that Reaſon were condemned by the Council, called in *Trullo*, *i. e.* aſſembled in the Hall of the Imperial Palace. As for his ten Books of the Recognitions, Cardinal *Baronius* ſays, That they had been corrupted by the *Ebionites*, even while *Clement* was yet alive; they were condemned in a Synod, under the Name of the Itinerary of St. *Peter*. They were tranſlated into *Latin* by *Ruſin*, who gave them the Name of Recognitions. To the ſame *Clement* is attributed a Liturgy, to which ſeveral Things have been added ſince.

Ignatius, Biſhop of *Antioch*, has left us his excellent Epiſtles to the *Epheſians*, *Magnetians*, *Trallians*, and to the *Romans*. From *Philippi* he wrote to the Church of *Tharſis*, to that of *Antioch*, and to the Deacon *Heron*, and from *Troades* to the *Philadelphians*, to the Chriſtians of *Smyrna*, and to *Polycarp*, their Biſhop. The laſt he wrote was that to the *Philippians*. *Euſebius* and St. *Jerome* mention but the ſeven written from *Smyrna* and *Troades*, but the others have his Character. *Voſſius*, and *Uſher*, Archbiſhop of *Armagh* in *Ireland*, both Proteſtants, have given us a new Edition of thoſe Epiſtles; the firſt has made uſe of a Manuſcript of the Library of the Great Duke of *Tuſcany*; and the ſecond of two he has found in *England*. They both agree to receive none for true, but thoſe written to the *Epheſians*, *Magneſians*, *Trallians*, *Romans*, *Philadelphians*, and to thoſe of *Smyrna*; as for that to *Polycarp*, *Voſſius* admits of it, and *Uſher* rejects it; without giving any eſſential Reaſon for ſo doing, for it is certainly very much like the others. As for the Epiſtles directed to the *Virgin Mary*, and to St. *John*, there's no doubt but they are entirely falſe and ſpurious.

In 123 *Quadratus*, who had then the Conduct of the *Chriſtian* Church at *Athens*, wrote an Apology for the *Chriſtian* Religion, which he preſented to the Emperor *Adrian*; and ſoon after *Ariſtides*, a *Chriſtian* Philoſopher, wrote another. Theſe two Apologies had for ſome Time their deſired Effect, which was to appeaſe the Perſecution againſt the *Chriſtians*. In 150 *Juſtinus*, an excellent Philoſopher, and a profound Theologian, wrote another Apology to defend the *Chriſtians* againſt the Calumnies and falſe Accuſations the *Pagans* charged them with. He preſented this Apology to the Emperor *Antoninus*, and to *Marcus* and *Lucius*, his Children, but to no Purpoſe. *Juſtinus* diſcovers in it the Chriſtian Ceremonies of the Baptiſm, and of the Euchariſt; but ſpeaking of the Angels, among ſeveral good Things, he mixes ſome Reveries, which the Fathers of thoſe Times were often guilty of. *Juſtin* in 165 wrote another Apology to refute the Calumnies of the Cynic Philoſopher *Creſcens*, which he preſented to the Emperor *Marcus Aurelius*, and to the Senate, and for which he received the Palm of Martyrdom. Beſides theſe two Apologies of *Juſtin*; he has left us ſome other Works, as *his Dialogue with* Triphon, a very learned *Jew*, his *Oration to the Gentiles*; his *Treatiſe of Monarchy*, or *of the Unity of God*. As for the other Works attributed to him, as the Expoſition of the Faith; the Epiſtle to *Zena* and to *Serenus*; the Queſtions of the *Gentiles*; the Queſtions and Anſwers to the Orthodox; we have great Reaſon to believe them apocryphal; becauſe of the Difference of the Style, of the Manner of explain-

explaining the *Chriſtian* Truths, and of ſeveral Quotations of Authors, who were not living when he died. *Euſebius*, St. *Jerome*, and *Photius* mention a Commentary againſt the Hereſies which we have loſt. *Photius* ſpeaks alſo of ſome other Treatiſes againſt *Marcion*, and againſt *Ariſtotle*; and of one intituled the *Pſalmiſt*. *Sixtus* of *Sienna* gives him a Commentary on the *Apocalypſe*.

We have alſo an Epiſtle of *Polycarp*, Biſhop of *Smyrna*, to the *Philippians*, which is almoſt entirely compoſed of Paſſages from the Epiſtles of St. *Paul* and of St. *Peter*, and has the ſame Air of Piety.

Meliton, Biſhop of *Sardis* in *Aſia*, to endeavour to ſtop the Rage and Fury of the Perſecution of *Marcus Aurelius*, wrote in 171 an Apology, which he preſented to that Emperor, but to no Purpoſe. We have loſt that Apology. *Euſebius*, in his Hiſtory, *c.* 25. mentions ſeveral other excellent Works of the ſame Author. The Treatiſe of the Death of the *Bleſſed Virgin*, ſuppoſed to have been compoſed by him, is an Injury offered to the Memory of ſo great a Man.

We find alſo among the Writings of the Fathers of the ſecond Century, an excellent Treatiſe of *Tatian*, born in *Syria*, (the ſame who afterwards became the chief of the Hereticks call'd *Ancratiſts*) in Defence of the *Chriſtians* againſt the *Greeks*; wherein he ſhews the Impertinence of the Belief of the *Gentiles*, the Crimes their Gods are made guilty of, by their Prieſts, and the Diverſity of the Opinions of their Philoſophers; but he intermixes ſeveral falſe, and ſuſpected Things, with the Truths, *viz.* that the Soul, which is mortal of its Nature, becomes immortal; ſpeaking of the Devils, according to the *Platonick* Philoſophy; and of the Word of God, as if he was not coeternal with his Father.

Clemens, Reader of the ſacred Scriptures in the School of *Alexandria*, whence call'd *Alexandrinus*, for, in Fact, he was born at *Athens*, has left us ſeveral excellent Volumes of his Works, and, in particular, his Tapſtries, his three *Books* of the *Pædagogy*; wherein he forms the Morals, or Manners of the *Chriſtians*, by the Example and Precepts of *Jeſus Chriſt*. In his Oration to the Gentiles, he attributes the Origin of Idolatry to the Worſhip of the Heavenly Bodies, to the Cuſtom of calling the Fruits of the Earth by the Names of Perſons while yet living, as that of *Ceres* to Wheat; of *Bacchus* to Wine; and to a political Conduct of inventing Devils, Furies, *Eumenides*, *Pluto*, *Cerberus*, &c. to deter Mankind from abandoning themſelves to the too great Extravagance of their Paſſions. We have loſt ſeveral others of his Works, eſpecially his continued Explanation of all the *Books* of the Scripture, mention'd by *Caſſiodorus*, *in Præf. inſt. div. Lect.* of which we have nothing left but a few ſhort Notes on the canonical Epiſtles.

Euſebius mentions *Papias*, as having wrote five *Books*, which he publiſh'd under the Title of *The Expoſition of the Words of our bleſſed Lord*. *Irenæus*, *Clemens Alexandrinus*, and *Origen*, quote a *Book*, intituled, *The Shepherd*, attributed to *Hermes*, mention'd in the Epiſtle to the *Romans*. This Work was much valu'd in the two firſt Centuries, nevertheleſs, it contains ſeveral Errors, for which *Pelagius*, Biſhop of *Rome*, rank'd it among the *apocryphal*; which, in my Opinion, is the fitteſt Place for it. I don't ſpeak here of the Narration we have under the Name of *Prochorus*, which is viſibly falſe, and full of Impertinencies; of the Acts of St. *Peter*, and of St. *Paul*, attributed to *Linus*, which are of the ſame Stamp; the Combat of the Apoſtles under the Name of *Abdias*, which is a Romance. The Paſſion of St. *Andrew*, written by the Prieſts of *Achaia*, has more Authority; St. *Bernard*, *Peter Damianus*, and ſeveral grave and judicious Authors, receive this Work. *Euſebius* ſpeaks of *Serapion*, who was made Biſhop of *Antioch*, after *Maximinus*, as of an excellent Writer; and ſays, that he had read ſeveral of his Treatiſes written againſt *Dannus*. *Theophilus*, Biſhop of *Antioch*, compos'd ſeveral Works, which are all loſt, except his Commentaries on the four Evangeliſts, and three *Books* addreſs'd to *Autolicus*, againſt the Calumniators of the *Chriſtian* Religion. *Euſebius* ſpeaks of an Eccleſiaſtical Hiſtory written by *Hegeſipus*, which is loſt; as for the *Books* of the Deſtruction of *Jeruſalem*, which appear under his Name, they are none of his Works.

The third Century produc'd ſeveral great Perſonages, eminent for their Eloquence, and profound Doctrine; particularly *Tertullian*, *Origen*, and St. *Cyprian*.

Tertullian was born at *Carthage*, toward the latter End of the ſecond Century. St. *Jerome* ſays, that while yet very young, he wrote a Treatiſe of the Cares and Sollicitudes of the conjugal State, which makes that Father ſuppoſe that *Tertullian* was already engag'd in it, and that he wiſh'd he had been free. Soon after, he publiſh'd the *Book* of *Preſcriptions*, againſt the Hereticks, of whom he gives a Catalogue, from the Church's Infancy. *Baronius* pretends, that in his *Book De Coronâ Militis*, (which he had wrote to juſtify the Conduct of a *Chriſtian* Soldier accus'd of Indiſcretion, and Imprudence, for having refus'd to put on his Head the Crown of Laurels; which intituled him to the Gratification of the Emperor) he was already fallen into the Errors of the *Montaniſts*, which appears by ſeveral bitter Expreſſions againſt the orthodox Biſhops, whom he calls *Lions in the Time of Peace*, and *Deers in Time of War*. *Tertullian*'s Apology is a Maſter-piece of Eloquence and Erudition; I know that its Latinity is not the beſt, but the Strength of the Proofs, the Beauty of the Thoughts, and the Subtilty of Reaſoning, make Amends for the Harſhneſs of the Style, which has a particular Character. The *Chriſtians* of thoſe Times were accus'd, by Idolaters, of killing Children, of feeding on their Fleſh, of adoring the Head of an Aſs, and of committing Inceſt; *Tertullian* purges them ſo well of all theſe Calumnies, in his Apology; the Innocence of their Lives is ſo well prov'd in it, and the Impoſture of their Enemies ſo clearly evidenc'd, that the Work is unanſwerable. This Apology was addreſs'd to the *Roman* Magiſtrates, in the Abſence of the Emperor, but to no Purpoſe. This Work is tranſlated into *French*, by *Gyri*, and ſo well that the Verſion is as good as the Original. *Tertullian* wrote, alſo, a Treatiſe, while at *Carthage*, which he addreſs'd to *Scapula*; in which he endeavours to diſſuade the Proconſul from perſecuting thoſe he ſhould rather protect and defend; enumerating to him all the publick Calamities which had happen'd in the Province, by a viſible Vengeance of Heaven, for the cruel Perſecutions of the Proconſuls, his Predeceſſors, againſt the *Chriſtians*: And proves, afterwards, that the Emperor had no better, nor truer Servants. He alſo wrote two *Books*, one of the *Spectacles*, and the other of *Idolatry*; in which he ſhews, that all thoſe Sorts of Repreſentations are juſtly abhorr'd by the *Chriſtians*. *Vincentius*, of *Lerins*, ſpeaking of theſe Works of *Tertullian*, which are yet all extant, ſays, that all his Words are ſo many Oracles, and his Thoughts as ſo many Victories. When St. *Cyprian* call'd for *Tertullian*'s *Books*, he us'd to ſay, *Give me the Maſter*.

Origen Adamantius had been Diſciple of *Clemens Alexandrinus*, and, according to St. *Jerome*, *Lib. de Scrip. Ec.* liv'd till the Time of the Emperors *Gallus* and *Voluſianus*. *Origen* was certainly the Miracle of his Time, for Piety, Virtue, Continence, Learning, and Eloquence; ſince while yet but eighteen Years of Age, he ſucceeded his Maſter in the Chair of *Alexandria*, as Profeſſor of Divinity; in which Employment he had the Honour of becoming the Maſter of thoſe who have been rank'd ſince among the moſt eminent Fathers of the Church. *Epiphanius*, *De Hæreſ. Ord.* 64. ſays, that *Origen* wrote 6000 *Books*, but moſt of them are loſt; thoſe we have left, are divided into two Tomes, or Volumes. The firſt contains 17 Homilies on *Geneſis*; 13, on *Exodus*; 28, on the *Numbers*; 16, on *Leviticus*; 26, on *Joſhua*; 9, on *Judges*; 1, on the *Books* of *Kings*; 9, on the 36th, 37th,

37th, and 38th *Pſalms*; 6, on the *Canticles*; 9, on *Iſaiah*; 14, on *Jeremiah*; 14, on *Ezekiel*; 3 *Books* on the Book of *Job*; 4, of the *Principles*. One Treatiſe of the *Lamentations* of *Origen*; one Dialogue of the right Faith in God; Commentaries on *Job*, tranſlated, and interpreted by *Joachim Du Peron*, four Homilies on the ſame.

The ſecond Volume contains 35 Treatiſes on St. *Matthew*; 39 Homilies on St. *Luke*; 32 Treatiſes on St. *John*; 10 Homilies on various Places of the *New Teſtament*; 36 *Books* on the Epiſtle to the *Romans*; 8, againſt *Celſus*; Dialogues againſt the *Marcionites*; *Philocalia*, or of the Love of Honeſty; an Epitome of the Hiſtory of *Suſanna*; an Epiſtle of *Julius Africanus*, relating to the ſame Hiſtory; and *Origen*'s Anſwer: Beſides his *Tetrapla*, *Hexapla*, and *Octapla*, heretofore mention'd.

Several of the Works here mention'd, are, by ſome, as well as ſeveral others of *Origen*'s *Books*, revoked in Doubt; as the Homilies on *Leviticus*, found among the *Books* of St. *Cyril*, which ſome ſuppoſe to be of *Origen*, as being written in his Style, and ſmelling much of his Errors; and ſome not. Three *Books* on *Job*, which I do not ſuppoſe to be of *Origen*, becauſe mention is made, in the firſt, of the *Homouſians*, whom he calls a *Sect of three Gods*, which has fill'd the Earth; but that Name *Homouſians* was invented by the *Arians*, who did not appear till after *Origen*'s Death; and in the ſecond the Author ſpeaks of the Martyrdom of *Lucianus*, as if it had happen'd in his Time; whereas *Lucianus* was born after *Origen*'s Death. The Commentaries on *Job*, interpreted by *Du Peron*, do not ſeem to be of *Origen*, becauſe in the Explanation, *c.* 3. he quotes the Expoſition of *Lucian Martyr*; and likewiſe, in the Explanation, *c.* 7, and 8. he refutes the *Manichæans* by Name; and in the 18th Chapter mentions the *Homouſians*. But the *Manichæans*, and *Arians*, who call'd the Orthodox *Homouſians*, began but after *Origen*'s Death. Some queſtion if the Homilies on the *Pſalms* be of *Origen*, or not.

No doubt but the Homilies on various Places of the Goſpel, are not of *Origen*, nor that on the firſt Chapter of St. *John*, wherein he mentions the *Manichæans* and *Arians*. In the 9th Homily on the various Places of the Goſpel, there are found ſome Fragments of St. *Jerome* on the laſt Chapter of the Prophet *Iſaiah*; and of St. *Gregory*, *C.* 15. *Moral. c.* 14. Two Fathers, who appear'd but after *Origen*, and conſequently are not of *Origen*; beſides, they are not writren in his Style. The fifth Treatiſe on St. *Matthew* appears to be of a *Latin* Author; and if the fifth is of a *Latin* Author, there is a great Likelihood that the other Treatiſes on the ſame Subject are likewiſe of a *Latin* Author.

Of all the Works attributed to *Hippolytus* by *Euſebius*, we have none left but his Treatiſe of *Antichriſt*, and ſome Fragments of thoſe of Theology, and of the Incarnation. We have all St. *Cyprian*'s Works, tho' *Gelaſius*, Biſhop of *Rome*, has condemn'd them as apocryphal. Tho' thoſe written in Defence of the Reiteration of Baptiſm, there's nothing in it but what's very agreeable to Orthodoxy; there are ſeveral other Works mix'd with his, which are not his, eaſily known by the Difference of the Style, which is notorious, and of a quite different Character. We have an Evangelical Harmony written by *Ammonius*, *Origen*'s Maſter, which we muſt not confound with that of *Titian*, which is heretical. *Julius Africanus* wrote an Hiſtory in fourteen Books, from the Beginning of the World to the Empire of *Martinus*; and according to his Supputation, there had elaps'd already 5723 Years; *Euſebius* has taken from it the beſt Part of his Chronology. This Work of *Julius Africanus*, was publick in *Photius*'s Time, but has been loſt ſince. We have left of that Author, an Epiſtle on the Hiſtory of *Suſanna*, which he treats as a Fable. St. *Baſil* quotes a Fragment of his Books, to prove the Divinity of the Holy Ghoſt. We have loſt his Volume wherein he treated of the different Diſpoſitions of an Army.

In the fourth Century, *Euſebius*, Biſhop of *Cæſarea*, under the Emperor *Conſtantine the Great*, wrote ſeveral Books, of which the following ones are yet extant, *viz.*

Fourteen Books of the Evangelical Preparation; ten, of the Evangelical Demonſtration; ten, of Eccleſiaſtical Hiſtory; four, of the Life of *Conſtantine*; one, againſt the Hereſy of *Hierocles*; one, of the Difference of Sentiments among Philoſophers; of Chronology, tranſlated by St. *Jerome*.

Of theſe, the Books of Evangelical Preparation, and Demonſtration, are imperfect; for *Euſebius* wrote (according to St. *Jerom. de Scrip. Eccleſ.*) fifteen Books of Preparation, and twenty of Demonſtration; tho' we have but fourteen of Preparation, and ten of Demonſtration. *Gelaſius*, Biſhop of *Rome*, condemn'd the Eccleſiaſtical Hiſtory of *Euſebius*, as apocryphal, becauſe, perhaps, the Hiſtorian is too laviſh of his Praiſes on *Origen*.

Euſebius wrote, beſides, under the Name of the Martyr *Pamphilius*, an Apology for *Origen*; tho' St. *Jerome*, *Lib. de Script. Eccleſ.* is of Opinion, that this Apology was really wrote by the Martyr *Pamphilius*. But, however, the ſame St. *Jerome*, *Lib.* 2. *in Ruff.* confeſſes, that he has found ſince, that this Apology was Part of that written by *Euſebius*, for *Origen*, whoſe Title *Ruffinus* had chang'd; and this he proves by the Teſtimony of *Euſebius* himſelf, who ſays, that *Pamphilius* never wrote but few Epiſtles.

St. *Athanaſius*, *Lib. De Decret. Nic. Synod.* accuſes this *Euſebius* of *Cæſarea* of *Arianiſm*; which Accuſation is ſupported by St. *Jerome*, in both his Books againſt *Ruffinus*, wherein he calls *Euſebius* ſometimes the Standard-Bearer, and ſometimes Prince of the *Arians*; which is alſo confirm'd by the ſeventh Council, *Act.* 5. which rejects the Authority of *Euſebius Pamphilius*, as being an *Arian*.

St. *Athanaſius*, Biſhop of *Alexandria*, under the ſame Emperor *Conſtantine*, and who died, according to St. *Jerome*, *Lib. de Scrip. Eccleſ.* under the Emperor *Valens*, wrote a great Number of Books, which we have digeſted into four Volumes; tho' theſe are not all he wrote; for St. *Jerome* mentions two Books againſt the Gentiles, one againſt *Arſacius* and *Valens*, one of the Titles of the *Pſalms*, and the Life of St. *Anthony*, Abbot, which are wanting, unleſs the Title has been chang'd.

The firſt Volume contains an Oration againſt Idols. Of the Incarnation of the Word. An Epiſtle to *Epictetus*, Biſhop of *Corinth*. An Expoſition of the Faith. An Epiſtle of *Liberius*, Biſhop of *Rome*, to *Athanaſius*. *Athanaſius*'s Anſwer. An Epiſtle to the People of *Antioch*. Of the eternal Subſtance of the Son, and of the Holy Ghoſt, with God. An Oration on the Unity of *Chriſt*. To his Brother *Adelphius*, againſt the *Arians*. Four Orations againſt the *Arians*. On this Sentence, *Ex Deo*, *Deus eſt verbum*, *i. e.* the Word is God of God. On this Paſſage, *Omnia mihi Tradita ſunt*, *&c.* all Things are given to me, *&c.* An Abridgment of the whole, againſt thoſe who ſay that the Holy Ghoſt is a Creature.

The Oration againſt the Idols, and the Book of the Incarnation of the Word, ſeem to be the two Books againſt the Gentiles, mention'd by St. *Jerome*; for at the Beginning of the Book of the Incarnation *Athanaſius* ſays, that having till then diſputed againſt Idols, he is a going to diſpute, likewiſe, of the Incarnation of the Word; that it might appear that thoſe two Books were join'd; and that the one was but a Part of the other, both being equally againſt the Gentiles.

In the ſame firſt Volume there is a certain Expoſition of Faith, which is very ſuſpicious, as being different from *Athanaſius*'s Symbol; for I don't ſee why he ſhould have made two Expoſitions of Faith, eſpecially ſo contrary to each other. In this Expoſition he ſays, that the three divine Perſons are not three

distinct Subsistences; and in his Symbol 'tis said, for there is one Person of the Father, another of the Son, and another of the Holy Ghost; and in the *Greek* another Hypostasis, *i. e.* Subsistence; for *Gregory Nazianzen* affirms, in his last Oration on *Athanasius*, that *Athanasius* himself had declar'd, that the Name Person had the same Signification among the *Latins*, with respect to the Trinity, as *Hypostasis* among the *Greeks*.

The Epistle of *Liberius* to *Athanasius*, and *Athanasius*'s Answer, appear to be spurious; because *Liberius* writes as if he had question'd the Faith of *Athanasius*, by ordering him to anathematize *Sabellius* and *Arius*; and his Letter begins by *Ergo*, then, without any Mark of Interrogation; which seems rather the Conclusion of a Letter, than a whole Letter. As for *Athanasius*'s Answer, it has not so much as the Form of a Letter, but only of a simple Confession of Faith, nor that neither conceiv'd in proper Terms; especially where he says, *That Flesh has been crucified, not himself; in it he has been subject to the Infirmities of human Nature, not himself.* For *Athanasius* us'd to express himself in other Terms, and more agreeable to the orthodox Faith, when he spoke of those Mysteries.

The second Tome contains an Apology to the Emperor *Constantius*; an Apology for his Flight; an Epistle to all the Orthodox; of the Sentiment of *Denis* of *Alexandria*; of the Decrees of the Council of *Nice* against *Eusebius*; the second Apology against the *Arians*; an Epistle to *Serapion*; an Epistle *ad Solitarios*; an Epistle to the Emperor *Jovinian*; of the Councils of *Arimini* and *Seleucia*; an Epistle to *Dracontius*, on his declining Episcopacy; and an Epistle to the Bishops of *Africa*; which Books, in my Opinion, are all genuine. There are, also, in this Tome, two short Epistles, after that to the Emperor *Jovinian*; which, for what Reason omitted in the Index, I know not.

In the third Tome are found the following Works, *viz.* of the Incarnation of the Word; of his having took human Nature; of the Incarnation of *Christ*; of the coming of *Christ*, against *Apollinaris*; a Sermon against Heresies; an Oration to the Philosopher *Maximus*; on this Passage, *You'll find the Colt*, &c. on the Passion of our Saviour; to *Marcellinus* of the Interpretation of the *Psalms*; of Virginity, or Meditation; Testimonies of the Scripture; of the natural Communion of the same Essence of the three Persons; to all, every where, through *Egypt*, *Syria*, &c. a Refutation of the Hypocrisy of *Meletius*; of the blessed *Mary*, Mother of God; on the Passion and Cross of the Lord; an Epistle to *Serapion*; on this Passage, *Whoever says the Word*, &c. a Disputation in the Council of *Nice*, against *Arius*; an Homily of the Sower; a Declaration on *Leviticus*, &c.

In this Volume the Sermon on the *Virgin Mary* does not appear to be of *Athanasius*; but of some later Author, who flourished after the third, fourth, and even the sixth Council; because he borrows the Expressions, with Respect to the *Virgin Mary*, made use of by those Councils in the Condemnation of *Nestorius*, *Eutiches*, and the *Monothelites*; for (as Cardinal *Baronius* justly observes, *Tom.* 1. *Annal. ad Ann. ch.* 48.) if this had been the Sermon of *Athanasius*, without doubt St. *Cyril*, and the Fathers of the third, fourth, and sixth Synod, had made use of it to convince the Heretick's of those Times. Add to this, that in the Explication of the Term ὁσια, he says that ισια signifies Equality; whenas in the *Greek*, ισοτης. is Equality, not ισια, and all this Etymology of the Term ὁσια, from ισος, is too trifling to be of *Athanasius*. It is not very certain, that what's intituled *Disputation with Arius*, is of St. *Athanasius*. Since that Disputation was not made in the Council of *Nice*, as indicated by the Title, but in some Monastery, as is evident from the very Beginning of the Book; neither was that Disputation with *Arius*, but with some of his Disciples; which is conspicuous from these Words, *de Repente ex Radice, Christu inimici* Arii, *Bellica, sub humanâ Specie ad nos insiluit*, i. e. Suddenly a Beast from the corrupted Root of *Arius*, Enemy of Christ, flew at us, *&c.*

The fourth *Tome* contains, Questions to Prince *Antiochus*; of Theological Definitions; Disputation with *Arius* at *Laodicea*; an Exhortation to the Monks; of the Passion of the Image of the Lord; an Epistle to *Mark*, Bishop of *Rome*; *Mark*'s Answer; an Epistle to *Serapion* of the Holy Ghost; 7 Books of the Unity in the Trinity; and a *Synopsis* of the whole Scripture.

There is almost nothing in this Tome of St. *Athanasius*. The Questions to *Antiochus* cannot be his, because the Author, *Quest.* 23. quotes *Athanasius*, and differs from him. In the *Question* 129. St. *Gregory* the Theologian is quoted, though a later Author than *Athanasius*; neither can he be the Author of the Theological Definitions, since his Sentiments are supported with the Authority of *Gregory* of *Nice*, who had not yet began writing when *Athanasius* died; since *Athanasius* died under *Valens*, and *Gregory* began to write, according to St. *Jerome*, under *Theodosius*. Add to this, that in this Book of the Definitions, the Author speaks so distinctly of the two Natures of *Christ* in one *Hypostasis*, that it must have been written after the Council of *Chalcedon*. The Book of the Passion of the Image of *Christ*, though received in the second Council of *Nice*, is not of this *Athanasius*, but of another more modern than this. Some Authors believe it spurious.

If we have any regard to Times, we'll find that the Epistles of *Athanasius* to *Mark*, Bishop of *Rome*, and *Mark*'s Answer, are fictitious. The seven *Books* of the Unity in the Trinity do not seem to me of *Athanasius*, because written originally in *Latin*, and not a Translation as it appears by the Style. As for the Symbole, which bears his Name, recited with so much Respect throughout all the Orthodox Churches, was certainly wrote by him. The Commentaries on all the Epistles of St. *Paul*, attributed to *Athanasius*, are of *Theophylact*.

St. *Basil* the Great, Archbishop of *Cæsarea*, in *Cappadocia*, flourished under the Emperor *Valens*, and died under *Gratian*. He has left us his Works, which were printed in four Volumes, at *Basil* in 1540. The first contains 11 Homilies on the Work of the six Days; 17 on the *Psalms*; 28 on various Subjects. The second, 2 Books of the Virginity; one of Paradise; 3 against *Eunomius*; 1 against the *Sabellians* and *Arians*; 1 of the Holy Ghost; 1 of Free-Will; 1 of Baptism. The third, 7 Sermons, *Ascetick*; 1 of the Judgment; 1 of the Confession of Faith; 80 Sums, of Morals; 55 Questions explained at length; 31 explained in Abridgment, monastick Constitutions. The fourth, 180 Epistles of *Basil*, and *Gregory* the Theologian; an Epistle to *Ceilon*, or *Chilonis*, of the Solitary Life; some other of his Epistles; an Oration against those who accused the *Christians* with admitting three Gods.

In the first Volume are reckoned 11 Homilies on the Work of the six Days; though St. *Jerom* mentions but nine. In the second is inserted a Book of Paradise; and in the Edition of *Antwerp*, in 1568, are found four Homilies on that Subject. There are also in the same Volume but three Books against *Eunomius*; and in the Edition of *Antwerp* there are five; though *Erasmus* of *Rotterdam* has thought fit to take off two, as unworthy of St. *Basil*.

St. *Gregory Nazianzen*, called the Theologian, had been, according to St. *Jerome*, School-Fellow of St. *Basil*, lived under the Emperor *Valens*, and died the eleventh of *Theodosius*. He wrote several Books, those, yet extant, in the *Cologne* Edition of 1570 are the following, *viz.* 4 *Books* of Apologetick; 3 Orations to several; 7 funeral Orations, or Sermons; 1 Oration in Praise of the Philosopher *Heron*; 3 Orations, or Discourses, on Peace; 5 Orations, or *Books* of Theology; 2 Discourses against the Emperor *Julian the Apostate*; 1 Epistle to *Clidovius*; 7 Discourses on Feast-Days, one Treatise of the Faith, one of the Faith of the Council of *Nice*; 17 Orations on various Subjects;

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Subjects; an Exhortation to a Virgin; one *Metaphraſis* on the *Eccleſiaſtes*; 80 Epiſtles.

His Poetry, a Tragedy, entituled *Chriſt's Sufferings*; Poems, 2 on his Affairs; 9 on the ſeveral Proofs of the *Old* and *New Teſtament*. An excellent Poem on the State of Virginity; one on the Precepts, to be kept by a Virgin; 13 Spiritual Epigrams; and 3 *Books*, in Verſes, of Spiritual Sentences.

The *Metaphraſis* on *Eccleſiaſtes* is not of *Gregory Nazianzen*, but of *Gregory Thaumaturgus*. The Tragedy is ſpurious, becauſe not written with that Gravity natural to *Gregory Nazianzen*.

St. *Ambroſe*, Biſhop of *Milan*, flouriſhed under the Emperors *Gratian* and *Theodoſius*, and died, according to *Baronius*, in the Year 397. His Works in the *Paris* Edition of 1549 are as follow.

In the firſt Tome, 3 *Books*, *de Officiis*; 3 *de Virginibus*; 1 *Inſtitutio Virginis*; 1 *ad Devotam Virginem*; 1 *ad Virginem lapſam*; 1 of Viduity; 2 of Penitence; 1 *de Fuga Seculi*; 1 *de Bono Mortis*. In the ſecond, 2 *Books* of the Vocation of the Gentiles; 5 of the Faith, to *Gratian*; 3 of the Holy Ghoſt, to the ſame, one of the Faith againſt the *Arians*, one of the Hiſtory of the Incarnation, one of the Hiſtory of the Reſurrection. In the third, a Funeral Sermon on the Death of *Valentinian*, another on the Death of *Satyrus*, a Diſcourſe on the Faith of the Reſurrection, another on the Death of *Theodoſius*; 10 *Books* of Epiſtles to ſeveral; 92 Sermons to the People. In the fourth, *Hexameron*, 6 *Books*; of the Paradiſe one *Book*; 2 *Books* of *Cain* and *Abel*, one of *Noah* and the Ark; 2 of the Patriarch *Abraham*, one of *Jacob* and the Bleſſed's Life; 2 of the Patriarch *Joſeph*, one of the Bleſſings of the Patriarchs, one of *Naboth* the *Jezreelite*, one of *Elias* and Faſt; 1 of *Tobiah*; 3 of the Interpolation of *Job* and *David*, an Apology of *David*; one of *Solomon*; one of thoſe who are initiated to the ſacred Myſteries; 6 of the Sacraments, one of the ſacerdotal Dignity, two of the Prayers before the Maſs or Liturgy, Commentaries on the 1, 35, 36, 37, 38, 39, 40, 43, 45, 47, 48, 61, and 118th *Pſalms*. Another Apology of *David*, of the Interpellation of *David*. In the fifth Volume, 10 Books on the Goſpel of St. *Luke*, Commentaries on all the Epiſtles of St. *Paul*, *Acephalus* of the Faith of the Reſurrection, Pious Prayers and ſacred Hymns, and the Cantick of St. *Ambroſe* and St. *Auguſtine*, called *Te Deum Laudamus*.

In the firſt Tome, the Book to the fallen Virgin is not of St. *Ambroſe*, becauſe it contains the Errors of the *Novatians*, concerning Penitence, who pretended that Sins were not to be forgiven 'till the Day of Judgment. In the ſecond, the Books of the Vocation of the *Gentiles* are falſly attributed to St. *Ambroſe*; ſince they are of St. *Proſperus*, they certainly cannot be of St. *Ambroſe*; ſince the Author in the firſt *Book*, *c.* 7, and in the ſecond, *c.* 8. diſputes againſt the *Pelagians*, who appeared but after St. *Ambroſe*'s Death. It is certain that ſome of the Epiſtles of the third Tome are not of St. *Ambroſe*, ſince in them the *Pelagians* are mentioned; no more than the Sermons, 9, 37 and 72, which are found among thoſe of St. *Auguſtine*. Likewiſe the Sermon 69, which is of St. *Euſebius*, Biſhop of *Vercelle*, and the 73 on St. *Cyprian* are found among thoſe of St. *Maximus*, with the Inſignificant Alteration of few Words, the following Sermons, *viz.* 3, 14, 30, 31, 32, 44, 47, 50, 51, 52, 53, 54, 56, 57, 58, 60, 61, 62, 66, 71, 77, 78, and 82, are Word for Word among the Sermons of St. *Maximus*; ſo that nobody can judge which of the two is the Author of them.

The 92d Sermon of the Baptiſm of St. *Auguſtin* differs much from the Style and Gravity of St. *Ambroſe*; and what's ſaid in that Sermon, that St. *Ambroſe* had prayed God to deliver him from the captious Diſcourſes of St. *Auguſtine*, is not credible; ſince St. *Auguſtin* was not converted by diſputing with St. *Ambroſe*, but by his Sermons, as he acknowledges it himſelf, *Lib.* 3. *Confeſſ. c.* 13. and *Lib.* 6. *c.* 1.

In the fourth Tome the laſt Apology of *David*; and alſo the laſt *Book* of the Interpellation of *David* don't ſeem to be of St. *Ambroſe*, becauſe of the Difference of the Stile, and becauſe the Author pretends that *David*'s Adultery was not a real Adultery, but is to be interpreted as an Allegory; whereas St. *Ambroſe*, in the true Apology, is of another Opinion, but only commends *David*'s Penitence. Several are of Opinion that ſome of the Commentaries on the Epiſtles of St. *Paul*, in the fifth Volume, are not of St. *Ambroſe*, and not without Cauſe; ſince the Author of thoſe Commentaries ſeem to be the ſame who has wrote the Queſtions on the *Old* and *New Teſtament*, found among the *Books* of St. *Auguſtin*; for the Doctrine of thoſe Commentaries, and of thoſe Queſtions, is ſemblable, as juſtly obſerved by the Cenſors of *Lovain* in their Notes on St. *Auguſtine*. The Stile ſeems alſo to be the ſame, and the Time is agreeable to it; for the Author of thoſe Queſtions, *Queſt.* 44. writes, that from the Siege of *Jeruſalem* to his Time, had elapſed 300 Years; to which, if the Years from Chriſt's Nativity, to the Siege of *Jeruſalem* be added, it will make up 372 or 373 Years, as it appears by the Chronicle of St. *Jerome*; and if the Author of thoſe Commentaries, and of thoſe Queſtions, is but one and the ſame Author, it appears evidently that St. *Ambroſe* is not the Author of thoſe Commentaries, ſince he wrote nothing before he was a Biſhop, and was not made a Biſhop, according to *Baronius*, before the Year of Chriſt 374.

There are ſome other Works added to thoſe abovementioned, in the *Roman* Edition of 1585, and attributed to St. *Ambroſe*, which are not his; as a Commentary on the *Apocalypſe*, and ſome others; but eſpecially the Explication of the *Apocalypſe*, wherein the Author mentions the *Lombards* invading *Italy*, which Invaſion did not happen 'till after St. *Ambroſe*'s Death.

St. *Jerome* flouriſhed in the 14th Year of the Emperor *Theodoſius*, and died under *Honorius*, *Anno Chriſt.* 422, in the 91ſt Year of his Age, according to the Chronicle of St. *Proſperus*, or in the Year 420, the 78th of his Age, according to *Baronius*. His Works are contained in nine Tomes, in the *Lyon*'s Edition, of 1530; but in the *Roman* Edition of 1565 and 1572, of *Marianus Victor*, though there is the ſame Number of Volumes, nevertheleſs what the former Edition had placed in the fourth Tome, is placed in this, in the eighth, and ninth; and what in the former was placed in the fifth, ſixth, ſeventh, eighth, and ninth; this places it in the fourth, fifth, ſixth, and ſeventh. We'll follow the Order of the firſt Edition.

Therefore the firſt Tome contains theſe Books, *viz.* 42 Epiſtles of Exhortation, to *Heliodorus*, and to *Ruſticus*; to *Læta*, and *Salvia*; two to *Agerœuchia*, to *Paulinus*, to *Paul*, and *Euſtochius*, in *Marcella*'s Name; three to *Marcella*, to *Paul Concordienſis*, to *Theophilus* of *Alexandria*, to *Caſtrutius*, to *Exuperantius*; to the Deacon *Julianus*, to the Virgins of the Mount *Hermon*; to *Ruffinus*, to *Cromatius*, and others. To *Antony*, to avoid a ſuſpected Company; to the Deacon *Sabinianus*, to *Nepotian*; two to *Florentinus*, to *Demetriade*, to *Furia*, to *Gaudentius*, to *Culentia*; two to *Euſtochius*, to *Licinius*, to *Abigaus*, to *Julian*; to *Caſtorina*, to the Monk *Theodoſius*, to *Auguſtine*, to the Deacon *Nicæus*, to *Chriſogonus*, to *Ruſticus*. In the ſame Tome there are Panegyricks, or Funeral Epiſtles, to the Number of fourteen, *viz.* on *Nepotianus*, on *Marcella*, on *Bleſilla*, on *Aſella*, on *Lea*, on *Paula*, on *Licinius*, on St. *Paul*, on *Malchus*, on *Fabiola*, on St. *Hilarion*. Laſtly, at the End of this Volume there is a Book of the eccleſiaſtical Writers. There is nothing in this firſt Tome which could be call'd in Queſtion.

In the ſecond there are Books againſt Hereticks, or Calumniators, *viz.* 1 againſt *Helvidius*; 2 againſt *Jovinian*; an Apology for his Books, againſt *Jovinian*; an Apologetick to *Domnionis*, to *Pammachius*, for the ſame Books; an Epiſtle to *Riparius*, againſt *Vigilantius*;

Vigilantius; a Book againſt *Vigilantius*, an Epiſtle to *Marcella* againſt *Montanus*, a Dialogue againſt the *Luciferians*, to *Avitus*, againſt *Origen*; to *John* of *Jeruſalem*, an *Origeniſt*; to *Pammachius*, of the Errors of *John* of *Jeruſalem*; to *Theophilus* againſt the ſaid *John*; three Books of Apologies againſt *Ruffin*; to *Cteſiphon* againſt *Pelagius*; three Books againſt the *Pelagians*; thirty Epiſtles to ſeveral, on different Subjects; and likewiſe eight Epiſtles of *Epiphanius*, *Theophilus*, and *Auguſtine*, to *Jerome*. This Tome is free from all Doubts, or Suppoſitions.

There are in the third, Prefaces, and Anſwers to Queſtions, *viz.* to *Paulinus*, of the Books of the Scripture; *Prefaces* on the *Pentateuch*; on *Joſhua*; on the Books of *Kings*; 2, on the *Paralipomenon*, on *Eſdras*; on *Tobiah*; on *Judith*; on *Eſther*; on *Job*; on the *Proverbs*; on *Eccleſiaſtes*; on the *Canticles*; on *Iſaiah*; on *Jeremiah*; on *Ezekiel*; on *Daniel*; on the twelve *Prophets*; on the four *Evangeliſts*. Then follows, in the ſame Tome, the Explication of Queſtions, propos'd by ſeveral, *viz.* by *Damaſus*, *Dardanus*, *Vitalis*, *Amandus*, *Minerius*, and *Alexander*; by *Cyprian*, *Paula*, *Evagrius*, *Marcella*, *Sophronius*, *Hedibia*, the Virgin *Principia*, *Fabiola*, *Ruffinus*, *Sunia*, and *Freſilla*, *Palgaſia*, *Paulinus*, and *Deſiderius*. Laſtly, there are, in the ſame Tome, Traditions, or *Hebraick* Queſtions, *viz.* on *Geneſis*; on the Books of *Paralipomenon*; on the Books of *Kings*. Likewiſe, Books of the *Hebraick* Places, or *Hebraick* Names, which occur throughout all the Books of the *Old* and *New Teſtament*.

In this Tome there is nothing dubious, except the Queſtions on the Books of *Kings*, and of *Paralipomenon*; becauſe St. *Jerome*, *Lib. De Scrip. Eccleſ.* affirms, that he has wrote *Hebraick* Queſtions on the *Hebraick* Places, and Names, of the *Geneſis*, but makes no mention of the Books of *Kings*, and *Paralipomenon*.

The fourth Tome contains Commentaries on the four great Prophets, and on the *Lamentations of Jeremiah*; the fifth, Commentaries on the *Eccleſiaſtes*, and the twelve little Prophets; the ſixth, Commentaries on St. *Matthew*; on the Epiſtles to the *Galatians*, to the *Epheſians*, to *Titus*, to *Philemon*, and the Book of *Didymus*, on the Holy Ghoſt, tranſlated into *Latin* by St. *Jerome*.

In theſe three Tomes all is genuine, except the Commentary on the *Lamentations*, which is ſuppos'd to be of *Rabanus*, becauſe found among his Works, and becauſe it contains ſome Paſſages of St. *Gregory*. After the Commentary on St. *Matthew*, follow'd one on St. *Mark*, which *Marianus* has prudently omitted, becauſe the Author of that Commentary did not underſtand, either the *Greek*, or the *Hebraick* Tongue; and in the Explication, c. 14, and 15. had wrote very fooliſh, and falſe Things.

In the ſeventh Tome are contain'd Commentaries on all the *Pſalms*, and the Verſion of St. *Jerome* from the *Hebrew*.

In this Tome the Commentaries on the *Pſalms* are revok'd in Doubt; for though St. *Jerome* aſſures us himſelf, *Lib. De Scrip. Eccleſ.* that he wrote on ſeven Pſalms, *viz.* the 14th, 15th, 16th, 17th, 18th, 19th, and 20th; and in his Epiſtles, to *Principia*, *Marcella*, and *Cyprian*; that he wrote, likewiſe, on the 44th, 89th, and 126th Pſalms. It is very certain, that the Treatiſes on the ſeven Pſalms are loſt; and as certain, that the Explication of the three others is of St. *Jerome*, as well as the ſhort Commentaries on all the Pſalms in general; becauſe St. *Auguſtine*, in his Epiſtle to *Fortunatianus*, quotes the Expoſition of St. *Jerome* on the 93d Pſalm, Word for Word, as it is found in this Commentary; which Opinion is ſupported by the Teſtimony of St. *Gregory*, who explaining theſe Words of the fourth penitential Pſalm, *a broken and a contrite Heart, O God, thou will not deſpiſe*, alledges St. *Jerome* explaining the ſame Paſſage; and that Expoſition is found in his Commentaries.

In the eighth Tome are found, the Commentaries of *Beda*, on *Job*, and on the *Proverbs*; *Origen*'s Homilies on the *Canticles*, and Commentaries on all the Epiſtles of St. *Paul*.

Marianus had juſtly refus'd to attribute the Commentaries on *Job* to St. *Jerome*, which he knew to be *Beda*'s Commentaries, ſince in the laſt Volume the Author mentions to have wrote in Favour of *Veſterius*, whom we learn from *Beda*'s Hiſtory to have been a Biſhop in *England*, in *Beda*'s Time. The Commentaries on the *Proverbs* are as juſtly attributed to *Beda*, ſince Pope *Gregory* is mention'd in the 21ſt and 30th Chapters; and in the 30th, St. *Jerome* himſelf by Name.

The Commentaries on all the Epiſtles of St. *Paul*, far from being of St. *Jerome*, are certainly of the Hereſiarch *Pelagius*; for St. *Auguſtine*, *Lib.* 3. *De Pec. cat. merit. & remiſſ. c.* 1. ſays, that he has read the ſhort Commentaries of *Pelagius* on all the Epiſtles of St. *Paul*; and lower, *c.* 12. quotes ſome Paſſages out of the Commentary on the ſeventh Chapter of the firſt Epiſtle to the *Corinthians*, which Paſſages are found in theſe Commentaries.

In the *ninth Tome*, the Epiſtle to *Demetriades*, which begins, *ſi ſummo Ingenio*, is *Pelagian*, and attributed by St. *Auguſtin* to *Pelagius*, and refuted, *lib. de Gratia Ch. c.* 22, 27, 37, 38, and 40. Likewiſe the Epiſtles to the Daughters of *Geruntius* are *Pelagian*, as well as that to a Friend on the Affinity of the Divine Law. The Epiſtles of the Eccleſiaſtical Writings place among the greateſt Ornaments of the Church, *Origen*, *Jovinian*, and *Pelagius*, who were Hereticks, and mentions *Hilary*, Biſhop of *Rome*, who ſucceeded *Leo* in that See, and who was not known 'till long after St. *Jerome*'s Death. The Epiſtle of the luxurious and frugal Son is *Pelagian*, and very different from the true Epiſtle of St. *Jerome* on the ſame Subject. The Symbole to *Damaſus*, which begins, *Credimus in Deum Patrem*, and concludes with theſe Words, *ſe imperitum & malevolum, vel non Catholicum, non me Hereticum comprobabit*, is not of St. *Jerome* to *Damaſus*, but of *Pelagius* to *Innocent*, as confirmed by St. *Auguſtin*, *L. de Gratia Chriſti*, *c.* 30, 31, 32, 33, where he ſays that *Pelagius* ſent a Profeſſion of his Faith to *Innocent*, and recites the Words of that Profeſſion, which are thoſe of this Symbol. The Epiſtles of St. *Auguſtin* to *Cyril*, Biſhop of *Jeruſalem*, are falſe and ſpurious; ſince it appears that *Cyril* of *Jeruſalem* died before St. *Jerome*. A Book of the Lives of the Fathers is alſo attributed to St. *Jerome*, but we muſt know, that that Book is not all of the ſame Author; for in the firſt Part are inſerted the Lives of Monks, written by *Evagrius*; which in St. *Jerome*'s Opinion, *Epiſt. ad Cteſiph.* are all falſe, except the firſt, which is that of the Abbot *John*. *Gennadius* attributes to the ſame *Evagrius*, the Lives of the Fathers, written in his Catalogue. To theſe Lives, written by *Evagrius*, have been added the Lives of *Paul*, firſt Hermit, of *Hilarion* and *Malchus*, written by St. *Jerome*, likewiſe that of St. *Anthony*, by *Athanaſius*, and that of *Mary the Egyptian*, by *Zozimus*. Alſo, ſeveral Things from the Collations of *Caſſian*; and *laſtly*, the Life of St. *Jerome*, written with a great deal of Partiality.

St. *John Chryſoſtom* was made Biſhop of *Conſtantinople*, the fourth Year of the Empire of *Arcadius* and *Honorius*, and died the 13th of the ſame Emperors, and the 9th of his Pontificat, *Ann. Dom.* 407. The Works we have left of his are diſtributed into five Volumes, in the Edition of *Venice*, of 1575; which are theſe, *viz.*

In the firſt Tome, 67 Homilies on *Geneſis*; 26 on the *Pſalms*; 52 on ſeveral Paſſages of the *Old Teſtament*, five of which are of the Viſion of *Iſaiah*. In the ſecond, 89 Homilies on St. *Matthew*; 54 of an imperfect Work, on the ſame; 26 on ſeveral Paſſages of St. *Matthew*; 14 on St. *Mark*; 7 on ſeveral Paſſages of St. *Luke*. In the third, 87 Homilies on St. *John*; 6 on ſeveral Places of St. *John*; 15 on the *Acts of the Apoſtles*; 32 Sermons of the *ſacred Feries*; 14 Ho-

14 Homilies on ſeveral Places of St. *Paul*; among which there are ſeveral Panegyricks on St. *Paul*. In the fourth, Commentaries, in Form of Homilies, on all the Epiſtles of St. *Paul*. In the fifth, 80 Homilies to the People of *Antioch*, 6 Dialogues, or Books of the Sacerdoce, 2 Books of the Compunction of the Heart, 6 Books of Gods Providence, 2 Books of praiſing God, a Book of Compariſon between a King and a Monk, 3 Books againſt the Calumniators of a monaſtick Life, a Book againſt the Gentiles, or on the Martyr *Babylas*; 12 Diſcourſes on Penitence, 15 againſt the *Jews* and *Hereticks*, 2 againſt Concubinage, 48 on various Subjects, 8 Epiſtles, 2 to Pope *Innocent*, 1 to *Cyriacus*, 1 to Biſhops and Prieſts impriſon'd for their Piety, 2 to the fallen *Theodorus*, 1 to *Eutropius*, 1 to *Olympias*, an illuſtrious Woman; and the Liturgy of St. *John Chryſoſtome*.

In the firſt Tome, the Homilies on *Geneſis*, on the *Pſalms*, and of *Iſaiah*'s Viſion, are, without Doubt, of St. *Chryſoſtome*; but among the Homilies on ſeveral Paſſages of the *Old Teſtament*, there is one on the 2d Chapter of *Geneſis*, which begins, *Deus inſtitutor mundi*, which cannot be of St. *Chryſoſtome*, ſince there are inſerted therein, 2 whole Chapters, extracted from a *Latin* Book, intituled, *Of the Eccleſiaſtical Dogma's*, viz. the 31ſt and 32d; which Book is of an Author later than St. *Chryſoſtome*. In the ſecond, the Commentaries on St. *Matthew*, are certainly of St. *John Chryſoſtome*; but the imperfect Work cannot be his; for I do not ſee any Reaſon why he ſhould have wrote twice, and ſo much on the ſame Subject: But, however, let who will be the Author of that Work, he was certainly an Heretick, or it has been corrupted by an Heretick; though, otherwiſe, the Book is very learned, and not at all to be deſpiſed. He ſays, in the 4th Homily, that *the Holy Ghoſt is the Miniſter of the Son*; and, Homily 48, ranks the *Homouſians* among *Hereticks*; which two Paſſages are of an *Arian:* On the contrary, Homil. 27, and 44, he condemns as Hereticks thoſe that ſay that *the Son is leſs than the Father*; which two Sentiments imply a Contradiction. Therefore the Author might have been orthodox, and his Work deprav'd by the *Arians*. In the ſame Tome there are Commentaries on St. *Mark*, which cannot be of St. *Chryſoſtome*, but are of ſome ſimple Monk who explain'd the Scripture to his Brethren, as it appears in the Homilies 3, 4, 8, and 9; but ſome of the others contain'd in this Tome are of St. *Chryſoſtome*, as the Homily of the Treaſon of *Judas*; Item of *Dives* and *Lazarus*. Item, Homil. 4, and others of the *Publicans*, *Phariſee*, of the Croſs and Thief; the reſt ſeems to be extracted, Part from the Commentaries on St. *Matthew*, Part from the imperfect Work, and Part from the Homilies on St. *Mark*. In the third Volume the 87 Homilies on St. *John*, are, without Controverſy, of St. *Chryſoſtome*; and, in my Opinion, the 55 on the *Acts of the Apoſtles*, though *Eraſmus* revokes them in Doubt. What's certain is, that Hom. 9. the Author ſtyles himſelf a Biſhop; Hom. 11. a Biſhop of a very great City; Hom. 41. he ſays that he liv'd in the Time of *Julian* the Apoſtate; and Hom. 52. that his Name is *John*. Therefore there's no great Reaſon to ſuppoſe it a ſpurious Work. Of the ſix Homilies intermix'd with the Commentaries on St. *John*, and on the *Acts*, there is no Reaſon to doubt, except the third, which begins, *Hirundinum Pulli*, &c. all the reſt are of St. *Chryſoſtome*, eſpecially the Homilies in Praiſe of St. *Paul*. There's nothing in the 4th Tome which could juſtly be revok'd in Doubt. In the 5th, almoſt every Thing is unqueſtionable, except the Homilies to the People of *Antioch*; of which, 'tis ſaid, that no more than 21 can be found manuſcript in the antient Libraries.

St. *Auguſtine*, Biſhop of *Hyppone* in *Africa*, was the greateſt Ornament of the *Chriſtian* Church in the 5th Century; he flouriſh'd *A. D.* 420, and died in 433, according to *Proſper*'s Chronicle. He wrote a very great Number of *Books*, which we have digeſted into ten Volumes.

The firſt Tome contains 2 Books of Recantations, 13 of Confeſſions, 1 of Grammar, 1 of Dialectick, 1 of the ten Categories, 1 of the Principles of Rhetorick, 6 of Muſick, 3 againſt the Academicks, 1 of Ordination, 1 of Beatitude, 2 of Soliloquies, 1 of the Maſter, 1 of the Immortality of the Soul, 1 of the Quantity of the Soul, 3 of Free Will, 1 of true Religion, 1 of the Manners of the Church, 1 of the Manners of the *Monks*, 2 of the *Geneſis* againſt the *Manicheans*, 3 of Monaſtick Rules, 1 of the Hermitical Life, to his Siſter. In this Tome nothing is dubious, but the Monaſtick Rules, and the Book of the Hermitical Life; for of thoſe Rules, none is of St. *Auguſtine*, the third excepted, which is mention'd in the 109th Epiſtle. The Book of the Hermitical Life cannot be of St. *Auguſtine*, becauſe in it are named St. *Benedict* and St. *Gregory*.

The 2d Tome contains all St. *Auguſtine*'s Epiſtles, and the Anſwers to them, to the Number of 222. The following 7 are found in his Retractations, and therefore are genuine, *viz.* 2 to *Januarius*, 1 to *Deogratias*, 1 to *Honoratus*, 1 to *Paulinus*, 1 to *Boniface*, and 1 to *Dardanus*. Though St. *Auguſtine* himſelf, *L.* 2. *Retract.* at the latter End, informs us, that all his Epiſtles and Diſcourſes are not contain'd in his Retractations. The 16 Epiſtles of St. *Auguſtine* to *Bonifacius*, and of *Bonifacius* to St. *Auguſtine*, which are found between the Epiſtle to *Honoratus*, *de fuga in perſecutione*, and that to *Edicia*, *de foro Continentiæ*, do not ſeem to be of St. *Auguſtine*; but they are ſo ſhort, that it matters not whoſe they are. The Epiſtles of St. *Auguſtine* to *Cyril*, and of *Cyril* to St. *Auguſtine*, on the Death and Miracles of St. *Jerome*, are falſe.

In the 3d Tome are found 4 Books of the *Chriſtian* Doctrine, 7 of the Locutions of the Scripture, 1 of the Faith and Symbol, 1 *Enchiridion*, 3 of the Trinity, an imperfect one of the *Geneſis*, 12 of the Letter of the *Geneſis*, 3 *de Mirabilibus Sacræ Scripturæ*, 1 of the Agony of *Chriſt*, one of the Work of the *Monks*, 1 *de Spiritu & Litera*, 1 *de Divinatione Dæmonum*, 1 of Eccleſiaſtical Dogma's, 1 *de Spiritu & Animâ*, 1 *de Fide ad Petrum*, 1 *Speculum*, 1 of ſmall Queſtions on the Trinity, 1 of the Bleſſing of the Patriarchs, 1 of Sentences.

The Book *de mirabilibus Sacræ Scripturæ*, is not found in St. *Auguſtine*'s Retractations, nor in the ſhort Index of *Poſſidius*; becauſe 'tis a Book beneath the Genius and Gravity of St. *Auguſtine*. The Book *de Eccleſiaſticis Dogmatibus*, does not ſeem neither to be of St. *Auguſtine*, becauſe fill'd with Paſſages of the Council of *Orange*, aſſembled after St. *Auguſtine*'s Deceaſe. *Algerus*, who liv'd in 1100, attributes this Book to *Gennadius*, as does, likewiſe, *Platina*, who ſays, in the Life of *Simachus*, Biſhop of *Rome*, that in that Prelate's Time, *Gennadius*, Biſhop of *Marſeilles*, wrote a Book of Eccleſiaſtical Dogma's. The Book *de Spiritu & Animâ* is not of St. *Auguſtine*, becauſe *Boëtius* is mention'd in it, who was not born when St. *Auguſtine* died, nor even till a long while after. That *de fide ad Petrum* don't ſeem to be of St. *Auguſtine*, becauſe not mention'd in the Retractations, nor in the ſhort Index; but rather of St. *Fulgentius*, becauſe directed to the Deacon *Peter*; and there was a Deacon of that Name very intimate with St. *Fulgentius*; beſides, the Style of this Book is very much like his, and *Bertramus*, who, towards the Year 850, wrote *de Corpore & Sanguine Chriſti*, quotes this Book as written by St. *Fulgentius*. The ſmall Queſtions on the Trinity, have been extracted from the Books of St. *Auguſtine*, but we do not know by whom; that of the Bleſſings of the Patriarchs is not of St. *Auguſtine*, but extracted from the *Hebraick* Queſtions of St. *Jerome*. The Book of Sentences is of St. *Auguſtine*, but collected by St. *Proſper*. In his Book *de Spiritu & Litera*, he ſhews by the Scripture, that the Perfection of Juſtice is poſſible, though without Example, as it was poſſible for twelve Legions of Angels to fight for *Chriſt*, though ſuch Thing did not happen.

This whole Book, almoſt, conſiſts in the Explanation of this Paſſage of the ſecond Epiſtle of St. *Paul* to the *Corinthians*, *c.* 3. *v.* 6. *For the Letter kills, but the Spirit giveth Life.*

The fourth Tome contains, one Book *de Mendacio*; one *contra Mendacium*; one of Faith and Works; 7 of Queſtions on the *Eptateuch*; one of evangelical Queſtions; one of Queſtions from St. *Matthew*; 4 *de Conſenſu Evangeliſtarum*; one of 81 Queſtions; one of 21 Sentences; 2 of Queſtions to *Simplicianus*; one of Queſtions to *Dulcitius*; *Queſtionum Sexaginta quinque*; *Queſtionum Veteris & Novi Teſtamenti*; one of the Care for the Dead; one of Catechiſing the Illiterate; 2 of the Incarnation of the Word; one of the Trinity and Unity of God; one of the Eſſence of the Divinity; one of the Faith of Things inviſible; one of the Subſtance of Dilection; one of Continence; one of Patience, one of the Good of Viduity; one of true and falſe Repentance; one of ſalutary Documents; one of Friendſhip or Amity; 2 of the Sermon of Chriſt on the Mount; an Expoſition began on the Epiſtle to the *Romans*; Expoſition of ſome Paſſages of the Epiſtle to the *Romans*; Expoſition of the Epiſtle to the *Galatians*; and Annotations upon *Job*.

The Book of Annotations on *Job*, though adopted by St. *Auguſtine*, in his Retractations, can ſcarcely be attributed to him; becauſe he ſays himſelf that he has found it ſo much disfigured by the Uncorrectneſs, or Infidelity of Copiſts, that he could not know it for his Work. The Book of the 20 Sentences, and that of the 65 Queſtions, do not ſeem to be of St. *Auguſtine*, not only becauſe they are not in his Retractations, but alſo becauſe they have nothing worthy of ſo great a Man. The Book of Queſtions of the *Old* and *New Teſtament*, is not of St. *Auguſtine*, but of ſome Heretick, becauſe he ſays, *Queſt.* 24. That the World has been made on Occaſion of the Preſumption of the Devil. *Queſt.* 21. That the Woman was not formed in the Image of God; and *Queſt.* 109. That *Melchiſedech* was the Holy Ghoſt. The Books of the Incarnation of the Word, of the Trinity, and Unity of God; of the Eſſence of the Divinity of the Faith of Things inviſible; of the Subſtance of Dilection; are not of St. *Auguſtine*, becauſe they are not found, nor in the Retractations, nor in the ſhort Index of *Poſſidius*, who was very careful in collecting the Works of his Maſter; neither have they the Taſte of the Style and Doctrine of St. *Auguſtine*. Thoſe of Continence, of Patience, of the Good of Viduity, are of St. *Auguſtine*, notwithſtanding what *Eraſmus* ſays to the contrary, becauſe they are in the ſhort Index of *Poſſidius*, and quoted by the venerable *Bede*, as of St. *Auguſtine*, in his Commentaries on the Epiſtles of St. *Paul*. The Book of the true and falſe Repentance, is not of St. *Auguſtine*, for, beſides, 'tis not mentioned in the Retractations, nor in the ſhort Index; the Author quotes, *c.* 17. ſome Sentences of St. *Auguſtine*, from which he differs afterwards. The Books of ſalutary Documents, and of Friendſhip, don't ſeem of St. *Auguſtine*, becauſe not placed in *Poſſidius*'s Index; the Stile, beſides, being too low, and the Diction too barren for St. *Auguſtine*; though they be pious and uſeful.

The fifth Tome contains the twenty-two Books *de Civitate Dei*, which St. *Auguſtine*, *l.* 2. *Retract. c.* 43. acknowledges for his, and calls a grand Work, as really it is, and the Time it was written in, and the Occaſion on which it was written, *viz.* the Subverſion of *Rome* by *Alarick*, King of the *Goths*, proclaims it ſuch.

The Books contained in the ſixth Tome are, one Book of the Hereſies, to *quod vult Deus*; an Oration on the five Hereſies; a Sermon to the Catechumens; a Diſcourſe againſt the *Jews*; of the Diſpute between the Church and the Synagogue; one Book of the Utility of Belief; one *contra Epiſtolam Fundamenti*; one of the two Souls againſt the *Manichæans*; one againſt *Fortunatus*, a *Manichæan*; 1 againſt *Adimantus*, a *Manichæan*; 33 againſt *Fauſtus*, a *Manichæan*; 2 of the Acts with *Felix*, a *Manichæan*; one againſt *Secundinus*, a *Manichæan*; one *de Natura Boni*, againſt the *Manichæans*; one of the Faith againſt the *Manichæans*; 2 againſt the Enemies of the Law and Prophets; 1 againſt the *Priſcillianiſts* and *Origeniſts*; *contra Sermonem Arianorum*; 3 againſt *Maximinus*, Biſhop of the *Arians*; one againſt *Felicianus* an *Arian*; of the Conjugal Good againſt *Jovinian*; one of the bleſſed Virginity; *de Adulterinis Conjugiis*, to *Poliantus*; one Treatiſe of the *Stoicks* and *Epicureans*; a Treatiſe of him who ſays, *ego ſum qui ſum.*

The Book of Hereſies is of St. *Auguſtine*, becauſe in the ſhort Index, and quoted by St. *Gregory*, *l.* 6. *Epiſt.* 179. though not mentioned in the Retractations. The ſmall Book or Diſcourſe of the five Hereſies, is of St. *Auguſtine*, becauſe placed in the ſhort Index, and quoted by *Bede*, in his Commentaries on the Epiſtles of St. *Paul*, *viz.* on the firſt Chapter of that to the *Romans*. We muſt form the ſame Judgment of the Sermon to the Catechumens, and of the Diſcourſe againſt the *Jews*. The Book of the Diſputes between the Church and the Synagogue don't ſeem to be of St. *Auguſtine*, becauſe it is not in the Recantations, nor in the Index of *Poſſidius*, and becauſe it contains Expreſſions, which were not uſed by St. *Auguſtine*. The three Books againſt *Maximinus*, though not in the Recantations, being placed in the Index of *Poſſidius*, and quoted by *Bede*, in his Commentaries, and by the ſixth general Council are, without doubt, of St. *Auguſtine*. The ſame Judgment might be formed of the Book againſt *Felicianus*, for the ſame Reaſons. The Treatiſe of the *Stoicks* and *Epicureans*, and that on theſe Words, *ego ſum qui ſum*, are ſo beautifully wrote, that, though not in the Recantations, nor in the Index of *Poſſidius*, they might be of St. *Auguſtine*.

The ſeventh Tome contains a *Pſalm contra Partem Donati*; 3 Books againſt the Epiſtle of *Parmenian*; 3 againſt the Letters of *Petilian*; 4 againſt *Creſconius*, the Grammarian; 2 againſt the Epiſtle of *Gaudentius*; 7 of Baptiſm againſt the *Donatiſts*; one of Baptiſm againſt *Petilian*; *Opus breviculi Collationis contra Donatiſtas*; *Sermo ſuper geſtis cum emerito*; 1 *de Geſtis cum emerito Donatiſta*; 3 *de Peccatorum meritis & Remiſſione*; 1 *de Naturâ & Gratia*; 2 of the Grace of Chriſt, and of the original Sin againſt the *Pelagians*; 2 *de Nuptiis & Concupiſcentiâ*; 4 againſt two Epiſtles of the *Pelagians*; 4 of the Soul, and of its Origin; one of Predeſtination and Grace; the Epiſtles of *Proſperus* and *Hilary* to *Auguſtine*; 2 *de Prædeſtinatione Sanctorum, & de bono Perſeverantiæ*; one of Predeſtination; one of Grace and Free-Will; one of Correption and Grace; one *ad Articulos ſibi falſo Impoſitos*; 6 *Hypognoſticon*, againſt the *Pelagians*; one *de Perfectione Juſtitiæ contra Cæleſtium*; one of the Actions of *Pelagius*.

The Book *de Naturâ & Gratiâ*, which without Controverſy, is of St. *Auguſtine*, is the fifth he wrote againſt the *Pelagians*, and an excellent Treatiſe on the Corruption of human Nature, by original Sin; and of the abſolute Neceſſity of a medicinal Grace; becauſe, ſays he, if our Nature was in perfect Health, as *Pelagius* pretends, and could by herſelf, without a ſupernatural Succour, accompliſh the Law of God; we could reaſonably conclude that Chriſt died in vain, which would be a Blaſphemy. He ſhews afterwards that Grace to be a free Gift, and not given for any particular Merit, all Men being wrapp'd up in a common Maſs of Condemnation; in which God could leave us, without we could have the leaſt Reaſon to accuſe him of Injuſtice. The two of the original Sin alſo againſt the *Pelagians*, are of the ſame Force. In that of the Grace of *Jeſus Chriſt*, he teaches that Grace does not conſiſt in the ſingle Poſſibility of doing good, under the Direction of our Free-Will, but in the *Infuſion of a new Dilection*, which heals our Will, and of *an agreeable and marvellous Suavity, which makes it love what ſhe has made us deſire or will*; and which is neceſſary to us, not only that we may act with Facility; but, without which, it is impoſſible we could act at all.

all; since *she gives us the Action*, without depriving us of our Liberty, nor even offending it. In the first Book *de Nuptiis & Concupiscentiâ*, which is also his, he proves that there must be a Distinction made between those two Things; and that Concupiscence does not proceed from Marriage, which is good in itself, but from the Concupiscence which is bad. In that, *de Correctione & Gratiâ*, he shews that from the Necessity of the Grace of God for each Action in particular, from its Gratuity, it being due to nobody, and which consequently he can refuse when he pleases; it does not follow that Sinners are not to be reprimanded; or that the Menaces, the sacred Scriptures are filled with, are vain, as we shall explain it more at large in our Treatise of Grace. In that, *de Prædestinatione Sanctorum*, he establishes, on several Passages of St. *Paul*, the Predestination of the Elects before the Prevision of their good Works, and according to the Will of God; but, in my Opinion, the strongest of his Arguments, is the Predestination of *Jesus Christ*, the first of all the Elects, which he shews clearly to have preceded all Sorts of Merit, and to have been entirely gratuite; which is an indubitable Proof that the Predestination of the Members cannot be operated in a Manner different from that of the Chief. The Book *de prædestinatione & gratia*, is not of St. *Augustine*, since it differs widely from his Style and Doctrine; for the Author says, *c.* 16. that Man could have been justly damn'd, though he had not sinn'd; contrary to what St. *Augustine* says, *Epist.* 10, and 106. and *L.* 2. *c.* 16. *de Peccat. mer. & remiss.* and elsewhere. The small Book, *de Predestinatione Dei*, is not of St. *Augustine*, because the Author says, towards the latter End, that Predestination proceeds from the Prevision of Works, which Doctrine St. *Augustine* refutes every where. *Responsio ad articulos, &c.* is of St. *Prosper*, and found among his Works. The *Hypognosticon*, though very learned, and of an antient Author, are not of St. *Augustine*, because they have not his Style, neither are they mention'd by *Possidius*, *Bede*, or any other antient Father. That, *de perfectione Justitiæ*, is of St. *Augustine*, because 'tis not only in the short *Index*, but is likewise often quoted, under the Name of St. *Augustine*, by St. *Prosper*, and the venerable *Bede*. The Book *de Gestis contra Pelagium*, was discover'd and printed, but in the Beginning of the sixteenth Century.

The 8th Tome contains Treatises on all the Psalms of *David*, which Work is mention'd in the short Index of *Possidius*, and acknowledg'd by every Body to be of St. *Augustine*.

In the 9th Tome are found, 124 Treatises on the Gospel of St. *John*, 10 on the first Epistle of St. *John*, 18 Homilies on the *Apocalypse*, 1 Book of Meditations, of the Love of God, 1 Book of Soliloquies, a Manual, 1 *de triplici habitaculo*, 1 *de Scala Paradisi*, 1 *de* 12 *gradibus abusionum*, 1 of the Contrition of the Heart, 1 *de Cognitione veræ vitæ*, 1 *de Speculo*, 1 of the *Christian* Life, of the Assumption of the Virgin *Mary*, 1 of the *Christian* Discipline, 1 *de decem Chordis*, 1 *de Cantico novo*, 1 of the Contempt of the World, 1 of the Vanity of the World, 1 of Obedience and Humility, 1 *de bono Disciplinæ*, 1 of the Visitation of the Sick, 1 *de consolatione mortuorum*, 1 *de quartâ feriâ*, *de Catacliſmo*, of Sobriety, *Speculum Peccatoris*, *de pœnitentiæ medicinâ*, of the Conflict of Virtues and Vices, *de quatuor virtutibus Charitatis*, of the Honesty of Women, 4 of the Shepherd and of the Flock, of the Symbol of Faith, *de Convenientiâ decem præceptorum, & decem Plagarum*; *de rectitudine Catholicæ Conversationis*, of the Utility of Fasting, of the Siege of the City, of the Creation of the first Man, of the Tree of Life, *de Pugna animæ*, of the Antichrist, *Psalterium matri suæ*, Exposition on the *Magnificat*.

Of so many Books, these only are uncontroverted, *viz.* the Exposition of the Gospel, and of the Epistle of St. *John*; all the rest are either dubious, or spurious.

In the 10th Tome are, 64 Homilies *de verbis Domini*, 35 *de verbis Apostoli*, 1 Book of fifty Homilies, 256 Homilies *de Tempore*, 51 *de Sanctis*, 76 *ad fratres in Eremo*, 2 Discourses *de communi vita Clericorum*, Discourses found at the *Cartusian* Monks at *Paris*, in the Beginning of the 16th Century, 128 found very near the same Time.

The Homilies, or Discourses *de verbis Domini*, and *de verbis Apostoli*, are all, or almost all, of St. *Augustine*; because in the short Index of *Possidius*; all the rest are dubious, except the Discourses printed at the Beginning of the 16th Century, especially those under the Direction of the Doctors of *Lovaine*, are all of St. *Augustine*, because in the short Index, and quoted by *Bede*.

St. *Augustine* died while he was answering, Book by Book, the eight *Pelagius* had wrote against him; he had already compos'd six of those Books, two of which *Claudius Menard* publish'd, towards the Middle of the last Century: He had extracted them from an old Manuscript, which is the Cause why they are so full of Faults, and *Lacunæ*; and Father *Vignier* was so happy as to find in the Library of *Clairveaux*, the four others which were suppos'd lost, and which he has publish'd, with several other new Works of that Father.

All these Works of St. *Augustine* have been preserv'd, notwithstanding the great Revolutions which have happen'd in *Africa*, and have made ever since they have been publish'd for the first Time, one of the greatest Ornaments of the most famous Libraries, though I had the Mortification, and the Happiness together, to find, some Time ago, that inestimable Book, *De civitate Dei*, of the *Paris* Edition, in a Cellar, at a Dealer in Second Hand *Books*, and which was design'd for Cheesemongers, if I had not sav'd it from those murdering Hands.

Socrates, *Ammonius*'s Disciple in the *Grammaire*, wrote, in this Century, his Ecclesiastical History, which he divides into seven *Books*, beginning where that of *Eusebius* ends, *i. e.* at *Constantine*, and contains 40 Years.

Sozomene, born at *Salamina*, in the Isle of *Cyprus*, compos'd likewise, in this Century, an Ecclesiastical History in nine *Books*, which begins at the Consulship of *Crispus*, *Constantine*'s Son. His Diction is more exact than that of *Socrates*, but we have lost the Narration of Things which happen'd during twenty Years. These two Historians are accus'd of having favour'd the *Novatians*.

Theodoret is more elegant than they, in his Ecclesiastical History, contain'd in five *Books*. He begins at the Heresy of *Arius*, and ends at the Time of *Theodosius* the younger. *Gennadius* says, that he had continu'd it as far as the Emperor *Leo*, in five other *Books*, which are lost.

Theodorus the Reader has also wrote an History in 2 *Books*, which begins at the Death of *Theodosius* the younger, and ends at the Empire of *Justinus*.

Besides the Originals, which are to be found in the most celebrated Libraries of *Europe*, we have a vast Number of Versions of these Histories, in several Languages.

Cassiodorus, Secretary of State to *Theodorick*, King of *Italy*, is one of the most famous Writers of the sixth Century. He has left us twelve *Books* of the divine Institutions, in which he teaches how the sacred Scriptures are to be read; twelve *Books* of Epistles, twelve *Books* of the History of the *Goths*, an Ecclesiastical History, extracted from those of *Socrates*, *Theodoret*, and *Sozomene*, call'd, for that Reason, *Tripartite*. A Chronicle, where Cardinal *Baronius* observes, he has been mistaken in several Things, and which the learned Chronologist considers as very imperfect. *Cassiodorus* had wrote several other Books, which are lost.

We have nothing left of the Writings of *Anastasius Sinaites*, but his Treatise against the *Acephales*, printed at *Ingolstat*, in 1606; and eleven Books of

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Anagogical Contemplations, on the Work of the Six Days; and five of the Dogma's of the Faith. *Poſſevin* ſays, that in the Libraries of *Auſbourg*, and *Vienna*, there are ſeveral others of his Works; and that his whole Homily on the *ſacred Sinaxis* is to be found in that of *Bavaria*.

Evagrius wrote his Eccleſiaſtical Hiſtory in ſix Books, beginning where *Theodoret* finiſhes his, and ending at the twelfth Year of the Emperor *Mauricius*. *Tiberius* and *Mauricius* rewarded him for his Works with ſome honourable Poſt, which ſhews that in an Age of Ignorance, as was the ſixth Century, the greateſt Monarchs of the World encourag'd Learning.

In the ſeventh Century flouriſh'd *Iſidorus*, Biſhop of *Seville*, who has left us a great Number of his Works, which were printed at *Paris*, for the firſt Time, in the laſt Century.

The *venerable Bede*, an *Engliſhman*, is the moſt famous ſacred Writer of the eighth Century. His Works are digeſted into eight Tomes, of which he gives himſelf a Catalogue. Cardinal *Baronius* pretends, that the Commentaries on the Epiſtles of St. *Paul*, compos'd of Paſſages of St. *Auguſtine*, are not his, but of one *Peter*, Abbot of *Tripoly*; but his Reaſons don't appear to me ſtrong enough to take that excellent Work from *Bede*. There are few ſcandalous Sheets mix'd with his, which never came from the Pen of ſo great a Man. We have loſt his Commentaries on *Iſaiah*, *Jeremiah*, and the twelve little Prophets.

John Damaſcenus, is one of the laſt Fathers of the Church; Father *L'Abbé* gave, in the laſt Century, a beautiful Edition of his Works.

The Eccleſiaſtical Writers of the following Centuries, are not of the ſame Authority in the Church, (eſpecially among *Proteſtants*) as thoſe heretofore mention'd; therefore leſt I ſhould appear too prolix on that Subject, I'll paſs them over in Silence, and proceed to *Church Books*, which I'll rank among divine Books, as being us'd in the publick Offices of Religion.

As there have been two Sorts of Churches, *viz.* the *Jewiſh*, and the *Chriſtian* Church; there have been, likewiſe, and ſtill are, *Jewiſh Church-Books*, and *Chriſtian Church Books*.

The *Jewiſh* Church-Books were, the *Books* of the *Law*, the *Hagiographa*, the *Prophets*, &c.

The *Hagiographa*, call'd, by the *Hebrews*, *Cetuvim*, comprehend the Books of *Pſalms*, *Proverbs*, *Job*, *Daniel*, *Eſdras*, *Chronicles*, *Canticles*, *Ruth*, the *Lamentations*, *Eccleſiaſtes*, *Eſther*. The Name is very antient; St. *Jerome* makes frequent mention of it. The *Jews* ſometimes call theſe Books the *Writings*, by way of Eminence, as being wrote by immediate Inſpiration of the Holy Spirit.

The *Chriſtian* Church's Books were divided in the firſt Ages of the Church, into *Latin* Church Books, and *Greek* Church Books.

The *Latin* Church Books are, 1. The *Pontifical*, which contains all the Prayers uſed in the Conſecration of Biſhops; Ordinations of Prieſts, Deacons, Subdeacons, Acolytes, Exorciſts, Porters, Clerks, *&c.* in the Conſecration of the *Chriſma*, of the Oil, *&c.* in the Dedication of Churches; in the Conſecration, or Bleſſing of the Veſſels uſed at the Altar, *&c.* 2. The *Miſſal*; which contains the *Canon of the Maſs*, and is a Compilation of ſelect Prayers, made by ſeveral Popes, at different Times, to be recited by the Prieſts, with a low Voice, immediately before, and after the Conſecration of the Bread and Wine; the Epiſtles, Goſpels, Collects, Prefaces, Offertories, *&c.* for all *Maſſes* throughout the whole Year. 3. The *Breviary*, containing the *Office*, or Liturgy, which every Prieſt, Deacon, and Subdeacon, is oblig'd to recite daily, throughout the whole Year, and which is recited or ſung every Day, in all Cathedral and Collegiate Churches; in all Convents or Monaſteries, of Monks, Fryers, and Nuns. 4. The *Diurnal*, which contains what's call'd *Les petites heures*, viz. *Prime*, *Tierce*, *Sext*, *None*, *Veſpers*, and *Complies*. 5. The Ritual, containing the Ceremonies for the Adminiſtration of Sacraments, and the Burial of the Dead. 6. The Pſalter, containing all the Pſalms, commonly with the Muſick to it, very ſolemn, call'd by the *Roman* Church *Chant Gregorian*; as began to be ſung, under the Pontificate of *Gregory the Great*, and by his Order. 7. The *Martyrology*, which is a Book containing a very ſhort Account of the Lives of Martyrs, Confeſſors, Virgins, *&c.* of all Ages, ever ſince the Beginning of the *Chriſtian* Church; and digeſted, by Order, with Regard to the Day, Month, and Year they died, or ſuffer'd in; under what Emperor, Proconſul, *&c.* which is read every Morning at the End of the Hour of *Prime*.

In the *Greek* Church, the Church's Books are, the *Menologium*, *Euchologium*, *Tropologium*, &c. alſo the Book of Peace, *Liber Pacis*, which is a Book given to be kiſſed in the Ceremony of the Maſs. The Muſick Book, containing the Pſalms, Troparies, and other Prayers of that Kind which are uſed to be ſung, with the Notes mark'd to each. Book of Liturgies, *Liber Liturgiarum*, containing not all the Liturgies of the *Greek* Church, but only the four now in Uſe, *viz.* the Liturgy of St. *Baſil*, of St. *Chryſoſtome*, that of the *Preſanctified*, and that of St. *James*; which is only uſed in the Church of *Jeruſalem*, and that but once a Year.

The *Engliſh* Church Books, in Uſe in the Middle of the tenth Century, as enumerated in *Elfrick*'s Canons, were, the *Bible*, *Pſalter*, *Epiſtles*, *Goſpel-Book*, *Maſs-Book*, *Song-Book*, or *Antiphonary*, *Manual*, *Kalendar*, *Paſſional*, or *Martyrology*, *Penitential*, and the *Leſſon Book*; but all theſe Books were aboliſh'd by 3 and 4 *Ed. 6. c.* 10.

The Books, call'd ſpiritual Books, are alſo a Sort of divine ones, as conducive to Piety and Virtue; ſuch are thoſe of St. *John Climax*, St. *Francis de Sales*, St. *Thereſa*, *Thomas a Kempis*, *Granadenſis*, Dr. *Horneck*, &c.

There are ſome Books eſteem'd as divine, by ſome *Chriſtian* Societies, and condemn'd by others as heretical, and by them call'd prohibited Books, becauſe forbidden by the Superiors of the Church.

The Popes in the *Roman Catholick* Church have the Power to condemn what Books they judge contrary to the Faith, and have eſtabliſh'd a Congregation at *Rome*, whoſe Buſineſs is to examine Books, and to put ſuch as they think fit to prohibit the reading or ſelling of, into the INDEX, which is the Name by which the Catalogue of prohibited Books is call'd. Thoſe Books, thus prohibited, are qualified, in this Index, as heretical, or ſchiſmatical, or tending to Hereſy, or Schiſm, *&c.* Among the heretical, ſome are heretical of the firſt Claſs, as the Books of *Sabellius*, *Arius*, *Neſtorius*, *Montanus*, *Marcion*, *Manes*, *Ebion*, *Novat*, *Paul* of *Samoſate*, &c. and others of the ſecond Claſs, as all the Books written in Defence of any Hereſy whatever. There is alſo this other Difference, that ſome of thoſe Books are condemn'd purely and abſolutely, and others only *donec corrigantur*, till they are corrected.

Philip II, King of *Spain*, was the firſt who procur'd an *Index* to be publiſh'd of the Books condemn'd by the Inquiſition of *Spain*. Pope *Paul* IV. took the Hint, and in 1559 order'd the Congregation of the holy Office at *Rome* to print a ſecond. *Pius* V. recommended the Matter to the Council of *Trent*, who made another; after this, the Duke of *Alva* procur'd another to be printed at *Antwerp* in 1571. *Clement* VIII, in 1596, publiſh'd a very copious one, call'd by the Name of the *Roman Index*. There were two others, publiſh'd in 1583, and 1612, by the Cardinals *Guiroci* and *Sandoval*; and ſeveral others by the Inquiſitors, and Maſters of the ſacred Palace. The moſt conſiderable of all the *Indices*, is that of *Sottomayor*, which was made for all the States ſubject to the King of

of *Spain*, and comprehends all the others, coming down as low as the Year 1667.

Moſt of the Books contain'd in the *Index*, have been burn'd by the common Executioners, to ſtigmatize them with a Mark of Infamy, and render them odious throughout all Ages; a ſevere Cuſtom borrow'd from the *Romans*, who uſed to have that Puniſhment executed by a legal Sentence. Sometimes the Care of the Execution was committed to *Triumviri*, appointed on Purpoſe; ſometimes to the *Prætors*, and ſometimes to the *Ædiles*. *Labienus*, whom, from his ſatirical Spirit, ſome call'd *Rabienus*, is ſaid to have been the firſt who underwent the Severity of it. His Enemies procur'd a *Senatus Conſultum*, whereby all his Books, publiſh'd during ſeveral Years, were order'd to be collected, and burnt. 'The Thing, 'ſays *Seneca*, then appear'd new and ſtrange to take 'Revenge on Learning; *Res nova & inſueta ſupplicium de ſtudiis ſumi! Caſſius Servius*, a Friend of *Labienus*, hearing the Sentence pronounc'd, cried aloud, 'That they muſt burn him too, ſince he had 'got all the Books by Heart.' *Nunc me vivum uri oportet qui illos didici.* *Labienus* could not ſurvive his Books, but ſhutting himſelf up in the Tomb of his Anceſtors, pin'd away, and was buried alive. Had *Labienus* wrote in our Days, the burning his Books had heighten'd their Merit, and his Reputation; and no Doubt made the Fortune of ſome Bookſeller or other.

I divide *human Books* into publick and particular *Books*. Publick Books are thoſe written for the Service, and Utility, or of the whole World in general; as the univerſal Hiſtory of the World; of the Government, Religion, Cuſtoms, Manners, Laws, *&c.* of all Nations; Treatiſes of all Sorts of Arts and Sciences, for a general Inſtruction; or of ſome Nation in particular, as the Hiſtory of the Beginning and Progreſs of a Nation; the Books of its Laws and Cuſtoms, the Books of Records, *&c.*

The Books which I call particular, are thoſe which do not concern immediately the general Good; and treat only of ſome particular Subject, which can only flatter the human Curioſity.

Among human Books, ſome are good, as thoſe which tend toward maintaining the juſt Harmony which ſhould ſubſiſt in a civil Society; or ſerve to promote Learning, the Arts and Sciences, Commerce, *&c.* others vicious and profane; ſuch are all thoſe written with the Deſign to debauch our Principles and our Morals; which nevertheleſs are, at preſent, the beſt Books, if we'll ſpeak the Language of Bookſellers, who call no other Books good, but thoſe which ſell well, let them be ever ſo obſcene. There are other Books call'd profane, though they are not criminal, nor vicious, but only to diſtinguiſh them from thoſe which treat of Matters of Religion, in the ſame Senſe we diſtinguiſh *profane* Hiſtory from *ſacred* Hiſtory. In this Senſe, *Seneca*, *Xenophon*, &c. are profane Authors, and all the Pontifical, Ritual, Augural, Aruſpicine, Acherontick, Fulgural, Fatal, *&c.* Books of the *Romans*, are to be accounted profane among us.

The Pontifical Books of the *Romans*, *Libri Pontificales*, were thoſe appointed by *Numa* to be kept by the *Pontifex maximus*, deſcribing all the Ceremonies, Sacrifices, Feaſts, Prayers, and other religious Matters, with the Manners and Circumſtances wherewith each was to be celebrated; theſe were alſo call'd *indigitamenta*, as containing the Names of all the Gods, and the Occaſions and Formula's of invoking each. The Ritual Books, *Libri rituales*, were thoſe which directed the Order and Manner of founding, building, and conſecrating Cities, Temples, and Altars; the Ceremonies belonging to Walls, Gates, Tribes, Curiæ, Camps, *&c.* the Augural Books, *Libri augurales*, call'd by *Cicero*, *Libri reconditi*, were thoſe wherein the Science of foretelling Futurity, from the Flight and Fluttering of Birds, were contain'd. The Aruſpicine Books, *Libri aruſpicini*, contain'd the Myſteries of divining from the Entrails of Victims. The Acherontick Books, (call'd alſo *Libri etruſci*, from a Suppoſition that they were the Work of *Tages* the *Etrurian*) contain'd the Ceremonies of the *Acheron*, which is the Reaſon why ſome confound them with the *Libri aruſpicini*, and others make no Difference between them and the *Libri fatales*, or fatal Books; wherein were written the Ages, or Terms of the Lives of Men, according to the *Hetrurian* Diſcipline. Theſe were conſulted by the *Romans* in all publick Calamities, and Inſtructions taken from them how to appeaſe the irritated Deities. The Fulgural Books, *Libri fulgurales*, were written touching Thunder and Lightning, and the Interpretation thereof; as that compos'd by the *Tuſcan* Nymph *Bigois*, preſerv'd in the Temple of *Apollo*. And the Sybilline Books were thoſe compos'd by certain Propheteſſes, depoſited in the Capitol under the Care of the *Duumviri*. We have but very few of all thoſe Sorts of Books left.

But we cannot ſay the ſame of the Books written by profane Authors, which have been carefully tranſmitted to us, even from the dark Times of *Homer*, in all their Purity, eſpecially thoſe of the moſt eminent in all kind of Erudition; for all human Sciences, and liberal Arts, having been more encourag'd by the *Romans* than by any other Nation, before or ſince, they had took Care to preſerve among them all the beſt Authors, written before the Foundation of the Republick, that they might ſerve as Rudiments to thoſe who would improve their natural Talents in the ſame Arts and Sciences, in which they had the deſir'd Succeſs; for we are oblig'd to confeſs, that very few Nations have produc'd ſo good Authors as the *Romans* have done, and none better.

Under the Reign of *Auguſtus*, which was alſo that of the Learned, *Pliny* excell'd in the natural Hiſtory, of which he has wrote ſeveral very curious Books, but they are diſgrac'd by a vaſt Number of Improbabilities, which have added a very ſcandalous Epithet to his Name. *Aſinius Pollio*, *Quintus Atherius*, *Caſſius Severus*, *Votienus*, *Montanus*, *Domitius Afer*, and *Quintilian*, acquir'd a very great Reputation for their Eloquence; we have the Inſtitutions of Rhetorick of the laſt, which deſerve the Name of a perfect Work. *Aſconius Pedianus* was an excellent Grammarian, and is very much valu'd for his Interpretations of *Cicero*, who carried the Palm for Eloquence, which is plainly ſeen in his Works, which have been, and will be admir'd throughout all Ages, as inimitable. An *Engliſh* Gentleman has lately tranſlated his Orations into *Engliſh*, with an admirable Succeſs, which I hope has met with a due Encouragement from the learned World. I ſpeak on this Occaſion according to my particular Sentiment, and without Partiality, ſince the Tranſlator is a perfect Stranger to me.

Poetry was alſo then carried to its greateſt Perfection. *Virgil* alone could be an Honour to ſeveral Centuries; *France* poſſeſſes all his Beauties in the excellent Tranſlation of the Abbot *de Villeloin*. *Ovid* for the happy Facility of his Expreſſions, *Tibullus* for his Purity, and *Horace* for his Strength and Energy, are plac'd in the firſt Rank of thoſe who cultivated then the Fields of the Muſes; the laſt hinder'd the *Romans* from envying *Pindarus* to the *Greeks*. *Lucan* by his beautiful Verſes excited *Nero*'s Jealouſy, who affected, with a Paſſion beneath a great Emperor, of being a Poet. *Lucan* had certainly a great deal of Wit, and a vaſt Genius, as appears in his Deſcriptions; but he was guilty of the Imperfection common to young Men, of going often farther than the Subject would bear. Some value him too much, and others too little; for if he has his Faults, he has alſo his Perfections. *Valerius Flaccus*, *Martial*, and *Juvenal*, appear'd under *Domitian*; the laſt is very much inferior to *Horace* for the true Character of the Satire. *Perſius*, who preceded him, was not willing, as I ſuppoſe, we ſhould underſtand him, and is not worthy of the Trouble his Interpreters have taken to explain him. As for the *tragical Seneca*, he is an excellent Original in his Kind. *Statius*, in his *Thebaides*, has

ſome Strength, but is not eaſily underſtood, and has Reaſon to confeſs that he follows the *Æneid* a-far off.

Tacitus is the moſt illuſtrious Hiſtorian of thoſe Times. *Titus Livy* had wrote in the Time of the Republick. The Learned are divided for theſe two Authors; each has his Merit, but thoſe of the beſt Taſte are for the firſt, againſt the ſecond, who certainly wants his Purity. The beſt Criticks of his Time have reproach'd him with Putavinity, *i.e.* that he had ſomething of the Dialect of *Padua*; but we are not capable at preſent of ſo nice a Diſtinction. We have loſt ſeveral Pieces of both, which had been a great Treaſure for our Libraries, and had inform'd us of a thouſand Things which have been buried in Oblivion, or which the other Hiſtorians have not exactly treated. The Brevity of *Tacitus* wants the whole Attention of a learned Man, not to be ſtopp'd by his Circumlocutions, which are rather *Greek* than *Latin*. *Valerius Maximus*, who was much in Favour with *Auguſtus*, *Higinus*, *Denis* of *Halicarnaſſe*, and *Joſephus*, acquir'd alſo a great deal of Eſteem; 'tis true, that the laſt who has wrote of the Antiquities and of the Wars of the *Jews*, is reproach'd with Negligence, and Want of Sincerity in his Narrations. Some Authors make *Quintus Curtius* contemporary with theſe abovemention'd; but if the Time when he liv'd is uncertain, every Body agrees that he has wrote very well the Hiſtory of *Alexander*, and that there cannot be a more florid Style.

Herodian is much valu'd for his Hiſtory, which he continues from the Death of *Antoninus* the Philoſopher, to *Balbinus* and *Maximus*, in eight Books; whoſe *Attick* Style, without Affectation, is clean and elegant. *Photius* ſays, that few Hiſtorians ſurpaſs him. It is from him we learn diſtinctly the Ceremonies of the *Apotheoſe*, or Conſecration of the *Roman* Emperors, which he deſcribes with a peculiar Care, on Occaſion of the Funeral Honours render'd to *Severus* by his two Sons. *Suidas* ſays, that *Herodian* had wrote ſeveral other Works.

Dion Caſſius, born at *Nice* in *Bithynia*, after he had been raiſed to the Honours of the Republick, as far as the Conſulſhip, by the Emperors *Commodus*, *Pertinax*, and *Alexander*, wrote a *Roman* Hiſtory, which gain'd him a great deal of Applauſe. Of the eighty Books divided into eight *Decades*, which it contain'd, we have loſt the firſt forty-four, of which we have but few Fragments. What follows, from the thirty-fifth to the ſixtieth, is perfect enough; but we have but an Abridgment of the five laſt, by *Xiphilinus*. He had began his Hiſtory at the Time of *Æneas*, and ended it at *Alexander Severus*, with whom he had been Conſul. In his Hiſtory we read thoſe two excellent Harangues of *Agrippa* and *Mecenas* to *Auguſtus*, on the Conſultation of abdicating the Empire, or of keeping it: Nothing of the Kind can be ſtronger, but he is juſtly blam'd for having ſhew'd himſelf too partial for *Ceſar* againſt *Pompey*, and for *Anthony* againſt *Cicero*, whoſe Reputation he endeavours to blacken, by puerile and malicious Accuſations. He likewiſe uſes *Seneca* very ill, and repreſents him as a Man more diſorder'd in his Life, than he appears wiſe in his Writings. *Photius* judges him clearer than *Thucydides*, whoſe high Style, ſays he, *Dion* has imitated in his Harangues. *Suidas* makes him the Author of ſome other Works, and *Raphael Valeran* gives him three Books, intitul'd, *the Prince*, and ſome Treatiſes of Morality.

The *Juriſprudence* had been happily cultivated, by *Ulpian*, *Paul*, *Pomponius*, *Sabinus*, call'd the *Cato* of his Age, *Fabius*, and *Modeſtinus*, who had been Privy Councellors, and Friends of the Emperor *Alexander Severus*.

But alas! the great Luſtre and Reputation Learning and the Learned had acquir'd during the fortunate Days of the Republick, and of the *Roman* Empire, ſuffer'd the ſame Eclipſe with its Glory; and we have never ſeen ſince another *Cicero*, another *Virgil*, an *Horace*, an *Ovid*, &c.

I have judged it abſolutely neceſſary, to enter here into this Particular, with Regard to Authors, that henceforward one might be capable to chooſe his *Books*, and to make a juſt Difference between good and bad Authors, which is a Science abſolutely neceſſary to thoſe who apply themſelves to the Study of the *Belles Lettres*. For how can we make Choice of a *Book*, if we have not the leaſt Notion of its Author? And how can we acquire that Notion, otherwiſe than by the Judgment the learned World has formed of him? therefore I conſider this Treatiſe on *Books*, as one of the moſt neceſſary, and the moſt eſſential of my whole Work; and as entertaining as any other. Several Authors, and *Chambers*, in particular, have attempted this Subject, with giving the Definition of very few of the *Books* here mentioned, but he goes no farther; therefore the Reader can learn from him that there have been ſuch and ſuch *Books*, and that there are yet ſuch and ſuch others; but we are left to chooſe among them thoſe we like beſt, without knowing how to chooſe them; which great Inconveniency I endeavour to remedy, by having conſulted the beſt Criticks of all Ages, eſpecially thoſe who could not be biaſs'd by any Conſideration whatever; and by ſtating fairly and candidly their ſeveral Sentiments.

I make no mention in this Place of the antient Philoſophers, becauſe I deſign to make a whole Treatiſe of their ſeveral Opinions.

Books are certainly of Divine Invention, ſince the oldeſt we have any warranted Account of, and which conſequently has been the firſt, is the Decalogue given to *Moſes* by God himſelf, who wrote it on Stones. Men afterwards taking the Hint from it began to write *Books* likewiſe, but on different Matters; for inſtead of Stones they made uſe of Parts of Vegetables for Matter of their *Books*, as of the Leaves and Barks; eſpecially the Leaves of Palm-Trees, and the Rinds and Barks of *Telia* or *Philyra*, and the *Egyptian Papyrus*; which continued long the common Matter of *Books*; inſomuch that moſt of the Names and Terms belonging to *Books*, in moſt Languages, are taken thence: As the *Greek Bibles*, the *Latin Liber*, *Codex*, *Folium*, *Tabulæ*, and the *Engliſh Book* itſelf. We may add, that Barks appear ſtill in ſome Meaſure retained for *Books* in certain of the northern Countries, as among the *Calmucks Tartars*, where a Library was lately diſcovered by the *Ruſſians*, of an unuſual Form, as well as Matter; the *Books* were exceedingly long, but no Breadth; the Leaves were thick, and made of Barks of Trees, ſmeered over with a double Varniſh; the Ink or Writing being white on a black Ground.

By Degrees Wax, then Leather, were introduced, eſpecially the Skins of Goats and Sheep, of which at length Parchment was prepared; then Lead came in Uſe; alſo Linen, Silk, Horn; and *Laſtly*, Paper itſelf.

We learn from Scripture that the firſt *Books* were in Form of Blocks and Tables, under the Appellation of *Sepher*, which the *Septuagint* render a ξοανα, Square Tables, of which Form the *Book* of the Covenant, *Book* of the Law, *Book* or Bill of Divorce, *Book* of Curſes, *&c.* appear to have been. But when flexible Matter came to be wrote on, they found it more convenient to make their *Books* in Form of Rolls, called by the *Greeks*, κυλινδια, by the *Latins*, *Volumina*, which appear to have been in Uſe among the antient *Jews*, as well as *Grecians*, *Romans*, *Perſians*, and even *Indians*. The Rolls, or Volumes, were compoſed of ſeveral Sheets, faſtened to each other, and rolled upon a Stick, or *Umbilicus*; the whole making a Kind of Column or Cylinder, which was to be managed by the *Umbilicus*, as a Handle; it being reputed a Kind of Crime to take hold of the Roll itſelf. The Outſide of the Volume was called *Frons*, the Ends of the *Umbilicus*, *Cornua*, Horns; which were uſually carved; and adorned, likewiſe, with Bits of Silver, Ivory, or even Gold and precious Stones. The Title, Συλλαβος, was ſtuck on the Outſide. The whole

whole Volume, when extended, might make a Yard and a half wide, and fifty long.

Of ſuch Books did the Libraries chiefly conſiſt, 'till ſome Centuries after Chriſt. The Form which obtains among us, is the Square, compoſed of ſeparate Leaves; which was alſo known, though little uſed among the Antients, having been invented by *Attalus*, King of *Pergamus*, the ſame who alſo invented Parchment; but it has now been ſo long in Poſſeſſion that the oldeſt Manuſcripts are found in it. *Montfaucon* aſſures us that of all the antient *Greek* Manuſcripts he has ſeen, there are but two in the Roll-Form, the reſt being made up much after the Manner of the modern *Books*.

To the Form of *Books* belongs alſo the Œconomy of the Inſide; or the Order and Arrangement of Points and Letters into Lines and Pages, with Margins, and other Appurtenances; which has undergone many Changes. At firſt the Letters were only divided into Lines, then into ſeparate Words; which by Degrees were noted with Accents, and diſtributed by Points and Stops into Periods, Paragraphs, Chapters, and other Diviſions. In ſome Countries, as among the Orientals, the Lines began from Right, and run to the Leftwards; in others, as the northern and weſtern Nations, from the Left to the Rightwards; others, as the *Grecians*, followed both Directions alternately, going in the one and returning in the other, called *Bonſtrophedon*. In moſt Countries the Lines run from Side to Side of the Page; in ſome, particularly the *Chineſe*, from Top to Bottom. Again, the Page in ſome is entire and uniform; in others divided into Columns; in others diſtinguiſhed into Text and Notes, either marginal, or at the Bottom; uſually it is furniſhed with Signatures and Catch-Words; ſometimes alſo with a Regiſter, to diſcover whether the *Book* be compleat. To theſe are occaſionally added the Apparatus of Summaries, or Side Notes; the Embelliſhments of red, gold, or enamell'd initial Letters, Head-Pieces, Tail-Pieces, Effigies, Schemes, Maps, and the like. The End of the *Book*, now denoted by *Finis*, was antiently marked with a ⊲, called *Coronis*, and the whole frequently waſhed with an Oil drawn from Cedar, or Citron Chips, ſtrewed between the Leaves to preſerve it from rotting. There alſo occurs certain Formula's at the Beginning and End of *Books*: As among the *Jews*, the Words, *eſto fortis*, which we find at the End of the *Books* of *Exodus*, *Leviticus*, *Numbers*, *Ezekiel*, &c. to exhort the Reader to be couragious, and proceed on the following *Book*. The Concluſions were alſo often guarded with Imprecations againſt ſuch as ſhould falſify them; of which we have an Inſtance in the *Apocalypſe*.

Books, with Regard to their Manufacture, may be divided into *Manuſcripts*; thoſe written with the Hand, whether originally by the Authors, called *Autographs*, or at Second-Hand, by *Librarii*, or *Copiſts*, &c. *Printed*, thoſe wrought off from the Preſs. *Books* in *Quires*, or *Sheets*, thoſe not bound, or ſtitched. *Books* in *Folio*, thoſe wherein a Sheet is folded but once, or makes two Leaves or four Pages. *Books* in *4to*, where it makes four Leaves; in *8vo*, where eight; in *12mo*, where twelve; in 16°, where ſixteen; and in 24°, where twenty-four.

There have been erected, almoſt ever ſince the firſt Invention of *Books*, at leaſt from the Time they began to increaſe in Number, particular Places for their Receptions, which Places, in Proceſs of Time, have been changed into publick Edifices, called Libraries, whoſe Origin is by ſeveral Authors attributed to the *Hebrews*; from whom the other Nations took the Hint, and *Oſmanduas*, King of *Egypt* firſt; who according to *Diodorus*, had a Library built in his Palace, with this Inſcription over the Door, Ψυχης Ἰατρειον, nor were the *Ptolemy*'s, who reigned in the ſame Country, leſs curious and magnificent in *Books*. *Eſdras*, *v.* 17. ſpeaks of a Library of the Kings of *Perſia*, which ſome imagine to have conſiſted of the Hiſtorians of that Nation, and of Memoirs of the Affairs of State; but in Effect, it appears rather to have been a Depoſitory of Laws, Charters, and Ordinances of the Kings. The *Hebrew* Text calls it the *Houſe of Treaſures*, and afterwards the *Houſe of the Rolls*, where the Treaſures were laid up. We may with more Reaſon call that a *Library*, mentioned in the ſecond of *Eſdras*, to have been built by *Nehemiah*, and in which were preſerved the *Books* of the *Prophets* of *David*, and the Letters of their Kings.

The Tyrant *Piſiſtratus* was the firſt who erected a Library at *Athens*, though *Strabo* refers the Honour of it to *Ariſtotle*. *Xerxes* tranſported that of *Piſiſtratus* into *Perſia*, which was afterwards brought back by *Seleucus Nicanor* to *Athens*, long after it was plundered by *Sylla*, and re-eſtabliſhed by *Adrian*. *Plutarch* informs us, that under *Eumenes* there was a Library at *Pergamus*, containing 200,000 *Books*. *Tyrannion*, a celebrated Grammarian, contemporary with *Pompey*, had a Library of 3000 Volumes. That of *Alexandria*, according to *A. Gellius*, contained 700,000 Volumes, all in Rolls, burnt by *Cæſar*'s Soldiers. *Conſtantine*, and his Succeſſors, erected a magnificent one at *Conſtantinople*; which, in the eighth Century contained 300,000 Volumes, all burnt by Order of *Leo Iſaurus*; and among the reſt, one wherein the *Iliad* and *Odyſſee* were written in Letters of Gold, on the Guts of a Serpent.

The moſt celebrated Libraries of antient *Rome* were the *Ulpian* and the *Palatin*. They alſo boaſt much of the Libraries of *Paulus Æmilius*, who conquered *Perſius*; of *Lucillius Lucullus*, of *Aſinius Pollio*, *Atticus*, *Julius Severus*, *Domitian*, *Serenus*, *Pamphilus Martyr*, and the Emperors *Gordian* and *Trajan*.

St. *Jerome*, *Anaſtaſius*, and others, inform us, that antiently every large Church had its Library, which is yet practiſed in ſeveral Chriſtian Countries; eſpecially in the Abbeys and other Monaſteries; each of which has its Library, more or leſs numerous. Moſt of thoſe Libraries are publick ones; that is to ſay, that the curious may reſort thither, at any Time, and entertain themſelves with what *Book* they pleaſe, which can be met with in that Library, without coſting them any Thing, if even they were to copy whole Volumes. That of St. *Victor*, of St. *Genevieve*, and ſeveral others at *Paris*, are of that Kind, and are embelliſhed not only with a vaſt Number of printed *Books*, but likewiſe with ſeveral antient Manuſcripts, ſome of them *Originals*, in all Languages. The moſt antient, moſt famous, and moſt rich in original Manuſcripts, and moſt numerous of the whole World, is that of the King of *France*, at the ſame Place, began by *Francis* I. augmented by Cardinal *Richelieu*, and compleated by M. *Colbert*, to which the learned and curious are alſo permitted to reſort. By the Regulation of the Library at *Paris*, no *Books* of any Kind can be publiſhed before two Copies of it, neatly bound, have been depoſited in the King's Library, which conſidering the Inclination the *French* Nation has to writing, and the great Number of religious Orders, who apply themſelves to it, eſpecially the celebrated Congregation of St. *Maure*, of the Order of St. *Benedict*, who publiſhed often ſeveral very conſiderable Works, as the Verſion of the antient Fathers, both *Greek* and *Latin*, with large Commentaries, muſt render, in Time, that Library, one of the Wonders of the World. I am ſurpriſed the ſame Method is not practiſed here in *England*, where there could be found as many good Authors, if they were to meet with the ſame Encouragement.

The next to this is that of the *Vatican* at *Rome*, founded by Pope *Nicholas* in 1450; and though it had been deſtroyed ſince by the Conſtable *De Bourbon*, in the taking of *Rome*, it was reſtored to its priſtine Splendor, by Pope *Sixtus* V. and conſiderably enriched with the Ruins of that of *Heidelberg*, plundered by Count *Tilly* in 1622.

The Emperor's Library at *Vienna*, according to *Lambecius*, conſiſts of 80,000 Volumes, and 15,940 curious Medals. That erected at *Florence* by *Coſmo de Medicis*,

Medicis, is ſaid to be one of the moſt compleat in *Europe*, over the Gate whereof is wrote, *Labor abſque Labore.*

The *Bodleian Library*, at *Oxford*, exceeds that of any Univerſity in *Europe*, and even thoſe of all the Sovereigns of *Europe*, except the King of *France*, and the Emperor of *Germany*, which are each of them older by a hundred Years. It was firſt open'd in 1602, and has ſince found a great Number of Benefactors; particularly Sir *Robert Cotton*, Sir *H. Savil*, Archbiſhop *Laud*, Sir *Kenelm Digby*, Mr. *Allen*, Dr. *Pocock*, Mr. *Selden*, and others. The *Vatican*, the *Medicean*, that of *Beſſarion* at *Venice*, exceed the *Bodleian* in *Greek* Manuſcripts, and the *Bodleian* exceeds them in Orientals. The *Cotton Library* conſiſts wholly of Manuſcripts, particularly of ſuch as relate to the Hiſtory and Antiquities of *England*, which, as they are now bound, make about 1000 Volumes. Moſt of the *Engliſh* Nobility and Gentry have an excellent Taſte for Learning, and a great Number of them have a ſelect *Library* of their own, which conſiſt of the beſt Authors both antient and modern; which ſhews their juſt Diſcernment in the Choice of their *Books*, of which they are competent Judges. No doubt but ſeveral of them, if they would take the Pains, or the Exigency of National Affairs could allow them Time to write, would acquire as great a Reputation in the learned World, as did the moſt celebrated Authors, during the moſt flouriſhing State of the *Roman* Republick. The moſt compact private Library, and the beſt ſtock'd with curious modern Books, in all Kinds of Literature and Languages, is that of *Joſiah Martin*, by Profeſſion a *Quaker*; and the greateſt Ornament of his Library, is himſelf.

I take no Notice here of *Books*, with regard to their Authors, *v. gr.* as that *anonymous Bocks* are thoſe without any Author's Name; *cryptonymous*, thoſe whoſe Authors Names are conceal'd, in ſome Anagram, or the like; *pſeudonymous*, thoſe which bear falſe Names of Authors; *poſthumous*, thoſe publiſh'd after the Author's Death; *genuine*, thoſe really written by the Perſons whom they pretend for their Authors, and ſtill remaining in the State wherein they were left by them; *ſpurious*, or *ſuppoſititious*, thoſe pretending to be written by others than their real Authors; *interpolated*, thoſe which ſince their Compoſition have been corrupted by ſpurious Additions or Inſertions. All I can ſay, on this Subject, is, that our Age is very fertile in Authors, but very ſterile in good *Books*: The little Encouragement Learning meets with, and the Monopoly of *Bookſellers*, render the Profeſſion of an *Author* ſo deſpicable, that none care to follow it, but thoſe who can do no better: Hence that Confuſion and Diſorder in the learned World, where the Ignorant and Illiterate, who can ſcarcely make the Difference between the Beginning and the End of a *Book*, ſet themſelves up for Authors, becauſe they are Maſters of ſome Ribaldry, and inſipid Notions, which divert the ignorant Rabble, encourag'd to it by ſome Printers, who can ſell their Works cheap, becauſe they coſt them little or nothing, from which none but Grocers, Cheeſemongers, *&c.* reap any Advantage; and when Complaint is made of it, to thoſe Retailers of bad Commodities, their Anſwer is, that the Taſte of the Age is ſo much deprav'd, that the Publick has none for thoſe ſort of Works which are conducive towards promoting Piety, Virtue, and Learning. Some of our beſt Authors are employ'd, at preſent, in National Jars, and Party Quarrels, when their Talents could be better employ'd otherwiſe, and more to the Advantage of the Republick. For though I admire the Vivacity of their Imagination, their Strength of Reaſoning, the Beauty and Elegance of their Style, the Fecundity of their Invention, (which is almoſt incomprehenſible, conſidering how long they have wrote on the ſame Subject, on either Side) and I read with a great deal of Pleaſure and Satisfaction their Works; it is my Opinion, (if I can take the Liberty to expreſs my ſelf in theſe Terms) that they could write, ſometimes, with more Decency and Circumſpection, and nevertheleſs write with the ſame Spirit; for there are by Intervals ſome Expreſſions in their Eſſays, which our Poſterity will never believe to have been wrote by the ſame Pen which has conducted the whole, but muſt conſider them as Interpolations maliciouſly inſerted therein, on purpoſe to diſfigure the whole Performance. I know, by Experience, that we are not always ſo entirely Maſters of our Paſſions, as to write always with the ſame Moderation, eſpecially when provok'd to Exceſs: But as we ſhould deſpiſe thoſe who forget themſelves ſo far, as to attack us in a Style unbecoming a Perſon of Honour, we ſhould alſo ſcorn to anſwer them in the ſame Style, ſince it is impoſſible we could be better reveng'd of their ſcandalous Aſperſions, than by publiſhing themſelves their own Scurrilities; the Filth they attempt to throw upon us, ſeldom or never miſſes returning back upon them, and their Works, or *Books*, are a kind of Common Sewer, the Stench whereof will always be avoided by the wholſomeſt Members of the Republick.

'Tis true, that the Rabble is diverted thereby, and nothing can pleaſe her more, than to ſee Perſons whom ſhe conſiders far above her, for their Education, Knowledge, and the Superiority of their Genius, uſe her Dialect: But what Man of Senſe and Underſtanding would blaſt his Reputation for ever, for the momentaneous Satisfaction of pleaſing the Rabble? An Author can never be too much valued for pleading in Defence of the Rights and Privileges of his Country; but that Defence ſhould never be founded on National Prejudices, ſince when the Humour of the Age is chang'd, and thoſe National Prejudices are vaniſh'd, the Defence is diſregarded, and the Author ſuſpected of having been actuated by other Motives than thoſe of a true and ſincere Love for his Country. When we write on thoſe intereſting Subjects, we ſhould conſider, that we write not only for the Age we live in, but likewiſe for future Ages; and that if we write with too much Partiality, and only to pleaſe a reigning Party, we run the Riſque of having our Works cenſur'd, and perhaps condemn'd, by a judicious Poſterity; who ſeeing Things in a Light quite different from that we are pleas'd at preſent to repreſent them in, eſpecially if they find our Writings over-ſtock'd with perſonal Reflections; which will make them ſuppoſe that we have made of ſome private Pique a National Quarrel. To purſue, *vi & armis*, always the ſame Perſon, and to repreſent even his moſt indifferent Actions as dangerous and criminal, is to ruin the Credit of our Writings in the Mind of all judicious Perſons; ſince *qui nimis probat, nihil probat:* Likewiſe, to attempt to vindicate the Conduct of that Perſon, as if he was not capable of committing the leaſt Fault, and to repreſent all his Imperfections as if they were ſo many Perfections, is to render him ſuſpected, and engage People to inſpect the narrower into his Conduct. Since it is impoſſible, let a Man be ever ſo perfect, that he ſhould always act with the ſame Dexterity, Prudence, and Diſcretion; to repreſent him otherwiſe, is an Impoſition on the Publick, which renders the Author ſuſpected of Flattery and Adulation: A Medium between both Extreams is the beſt. Neither are we to blame an Author for undertaking the Defence of a Perſon we hate; for why ſhould he not have as much Right to defend him, as we have to attack him? Such Partiality ſhews as if we were our ſelves conſcious of his Innocence, but would be glad to repreſent him otherwiſe, and ſorry that others ſhould repreſent him ſuch as he is. Where's that Freedom, where's that Liberty we ſeem to contend for, if we attempt to be Judges, and Parties in our own Cauſe? Muſt a Man be criminal becauſe we will have him ſo? And muſt it be a Crime to undertake his Defence, becauſe we accuſe him? Or is it impoſſible he ſhould be innocent when we accuſe him? What Temerity! what Injuſtice! Let us act with more Moderation, Modeſty, and Wiſdom. If we cenſure in our Writings the Conduct of a Perſon, let others endeavour to juſtify that

that Conduct, if they can, without accuſing them of Stupidity and Ignorance; ſince the worſe is the Cauſe, the greater muſt be their Capacity to defend it. Beſides, to pretend to have all the Merit on our Side, excluſive of all others, is a ridiculous Vanity, to be laugh'd at by the whole World; and if it was ever ſo true, that their Writings are nothing elſe but a Texture of Incoherencies, falſe Reaſoning, and Blunders; far from being provok'd, we ſhould be pleaſed at it, ſince they add a new Luſtre to ours: And if not, our Railings, and our endeavouring to repreſent them otherwiſe than they are in Reality, will have the ſame Effect on theirs; for we cannot expect to impoſe on the Publick ſo far, as to force him to ſubmit his Judgment to ours; every Body will have the Liberty to judge by himſelf, and if after an impartial and ſerious Examen they find we judge wrong, what Opinion can they have afterwards of our Underſtanding? Will not then our Writings loſe a great deal of their former Credit and Reputation? To have no other View in our Writings than to pleaſe and divert the Rabble, is to condemn our ſelves voluntarily to a dirty Drudgery, beneath a Man of Senſe and Education; and to be too popular, is to become the Slave of the Rabble. Is an Author willing to render a ſignal Service to his Country, let him endeavour to reform by his Writings thoſe Exceſſes, in the Vulgar, which renders him odious and inſupportable; inſtead of prompting him to abandon himſelf to thoſe Exceſſes which have been ſo often attended with fatal Conſequences. Authors complain of the deprav'd Taſte of the Age, and of the little Encouragement given to Merit and Learning; let them trace the Source and Origin of ſuch a Diſorder, and they'll find it in themſelves; for would they leave off their Ribaldry, and all act in Concert to furniſh the Nation with better Subjects, they would ſoon find the Taſte chang'd; were not the Shops of Bookſellers ſtock'd with obſcene Books, to the Shame of our Clergy, and the Scandal of a *Chriſtian* Country; were a Reſearch made of thoſe criminal Books, calculated to deprave the Principles of Youth, and debauch their Morals, and all that *Farago* committed to the Flames, to make Room for Treatiſes on Religion, Piety, Sciences, Arts, *&c.* we ſhould ſoon ſee a happy Reformation, in the ſeveral Orders of the Republick, from which Authors would reap ſome ſignal Advantages to themſelves.

BOOK-BINDING.

BOOK-BINDING, is the Art of gathering, and ſewing together the Sheets of a Book, and covering it with a Back.

The Art of *Binding* Books, when firſt the ſeveral Sheets of the Writings of Authors were collected together, was not attended with great Difficulties; for the Leaves were only glued together, and rolled on round Pieces, or Cylinders of Wood; which Manner of *Book-binding*, whoſe Invention is attributed to the *Egyptians*, was continued till long after the Age of *Auguſtus*, and is ſtill retain'd by the *Jewiſh* Synagogues, where they continue to write the Books of the Law on Vellums ſew'd together, making, as it were, only one long Page, with two Rollers, and their Claſps of Gold or Silver at their Extremities, the whole Book being wrapp'd up in a Piece of Silk, which ſerves as a Cover to it.

But as this Manner of *Binding* Books is attended with many Inconveniencies, one of the *Attali*, Kings of *Pergamus*, invented the Form now in Uſe, of ſquare *Binding*, or of ſewing ſeveral Quires one over another, as more commodious to the Reader, who can open and ſhut his *Book* in an Inſtant, and without the leaſt Difficulty, and without the Leaves being expos'd to wear out ſo ſoon as when roll'd up, eſpecially of *Books* written or printed on Paper.

Before we proceed on the Manner of *Book-binding*, it will not be improper to fit up the Shop of the *Book-binder* with the ſeveral Tools or Inſtruments belonging to his Profeſſion; which are, *Folding ſticks*, *Hammers*, to beat the Leaves, and turn the Back, a *Sewing Preſs*, a *Cutting Preſs*, *Sheers*, a *Plough*, *Knives*, a *Smoother*, *Bruſhes*, *Dog's Tooth*, *Punchions*, and little Cylinders of Braſs engraven in *Relievo*, in various Forms and Devices, for Ornaments; *Gold* for Gilding, Calf Skins, Parchment, Whipcord, Packthread, Needles, Backing-boards, *&c.*

Folding-ſticks are Slips of Ivory, or Box, of about two Fingers broad, and eight or ten Inches long, edg'd on each Side, for the Conveniency of parting the Leaves aſunder, when Occaſion requires it.

Cutting Preſs is a Machine conſiſting of two large Pieces of Wood, in Form of Cheeks, join'd by two ſtrong wooden Screws, which being turn'd by an Iron Bar, draw together, or ſet aſunder the Cheeks, as much as is neceſſary for the putting in of the *Books*. The Cheeks are plac'd flat on a wooden Stand, in Form of a Cheſt, into which the Cuttings fall. Aſide of the Cheeks are two Pieces of Wood, of the ſame Length with the Screws, ſerving to direct the Cheeks, and prevent their approaching or opening unequally upon turning the Screw. Upon the Cheeks is the Shaft or Fuſt, to which the Cutting-Knife is faſten'd by a Screw, which has its Key to diſmount it on Occaſion, to be ſharpen'd.

The Shaft conſiſts of ſeveral Parts; among the reſt, a wooden Screw, or Worm, which catching within the Nuts of the two Feet that ſuſtain it on the Cheeks, brings the Knife to the *Book*, which is faſten'd in the *Preſs* between two Boards. This Screw, which is pretty long, has two Directories, or Pieces of Wood, which both as to their Form and Effect reſemble thoſe of the Screws of the Cheeks. To make the Shaft ſlide ſquare and even on the Cheeks, ſo that the Knife puſh'd along by the Workman may make an equal Paring, that Foot of the Shaft where the Knife is not fix'd has a Kind of Groove, directed by a Thread faſten'd along one of the Cheeks. Laſtly, the Knife is a Piece of Steel, ſix or ſeven Inches long, flat, thin, and ſharp, terminating at one End in a Point, like that of a Sword; and at the other in a ſquare Form, which ſerves to faſten it to the Shaft.

The *Book-binder* being inſtated into his Shop, furniſh'd with all its Implements, we'll begin to work, firſt with our *Folding-ſtick*, with which we'll *fold* the Sheets, according to the Form, *viz.* into 2 for *Folio's*; 4 for *Quarto's*; 8 for *Octavo's*, &c. being directed therein by the Signatures, or Catch-words, at the Bottom of the Page.

Note, That by SIGNATURE is underſtood, in this Place, a Mark at the Bottom of each Sheet, to ſhew the Number and Order of the Quires and Sheets. The *Signatures* conſiſt of the Capital Letters of the Alphabet, and change in every Sheet. If there be more Sheets than Letters in the Alphabet, to the Capital Letter is added a ſmall one of the ſame Sort, *i. e.* a little *a* after a great *A*, &c. which is repeated as often as is neceſſary.

The Leaves thus *folded*, and laid over each other, in the Order of the *Signatures*, are beaten on a Stone with a Hammer, to make them ſmooth, and open well, and then preſs'd. While in the Preſs, they are ſew'd upon *Bands*, which are Pieces of Cord, or Packthread, ſix Bands to a *Folio Book*, five to a *Quarto*, *Octavo*, &c. which is done by drawing a Thread

through the Middle of each Sheet, and giving it a Turn round each Band, beginning with the firſt, and proceeding to the laſt. The *French Book-binders* apply a Slip of Parchment, the Length of the *Book*, on the Inſide of each Paſteboard, ſo, however, as that being cut, or indented, in the Places againſt the Bands, it comes out between the Edge of the Paſteboard and the Leaves of the *Book*, to cover the Back. They call this *Indorſing*, and they are oblig'd to do it on the Penalty of 30 Livres, and the *re-binding* of the *Book*. It is done in the Preſs, where the Back being grated with an Iron Inſtrument with Teeth, to make the Paſte take hold, wherewith the Parchment is firſt faſten'd, they afterwards add ſtrong Glue to fortify it. After this the *Books* are glu'd, and the Bands open'd, and ſcrap'd, for the better fixing the Paſteboards; the Back is turn'd with a Hammer, and the *Book* fix'd in a Preſs between two Boards, call'd *Backing-boards*, in order to make a *Groove* for fixing the Paſteboards; which being applied, Holes are made, for fixing them to the *Book*, which is preſs'd a third Time, and then cut by the Plough. Then the *Book* is put at laſt to the *Cutting-Preſs*, betwixt two Boards, the one lying even with the Preſs, for the Knife to run upon; the other above it, for the Knife to cut againſt; after which, the Paſteboards are ſquared with a Pair of Sheers.

The next Operation is the *Sprinkling* the Leaves of the *Book*, which is done by dipping a Bruſh made of Hog's Briſtles into Vermilion and Sap Green, holding the Bruſh in one Hand, and ſpreading the Hair with the other; by which Motion the Edges of the Leaves are ſprinkled in a regular Manner, without any Spots being bigger than the others, at leaſt ſo far as to be diſagreeable to the Eye.

Before this cheap Invention was found of ſprinkling the Edges of *Books* with Colours, it was the Cuſtom to have them gilded, eſpecially valuable *Books*, which is yet practis'd in *France* for *Church Books*; and is done by putting the *Book* in the Preſs between two Boards, ſcraping and ſmoothing it, to take off all the Scratches, and afterwards ſcraping ſome yellow Oker upon it, which when ſcrap'd muſt be wetted with a very ſmall Quantity of Size-water, and rubb'd off with ſome clean Shavings of the *Book*. The Leaves being again wetted with a Bruſh dipp'd in the Size-water (made with the White of an Egg mix'd with Water, and well beat together) the Gold is laid upon it, and afterwards dried before the Fire. When dried, it is burniſh'd with a *Dog's Tooth*, or an Ivory Nob.

The Abbot *de Seuil* renew'd, in the Beginning of this Century, the antient Practice of making Ornaments with hot Irons, of various Forms and Devices, on the gilded Edges of the *Books*, which the *French* call *doré ſur Tranche*; in which he ſucceeded very well; though, in my Opinion, thoſe Sorts of Ornaments do not produce ſo good an Effect as a plain Gilding well burniſh'd, and without Ornaments: Neither do I find that the *French Book-binders* have been very fond of this newly-reviv'd Invention, no more than they are of Gilding at all the *Tranche*, or Edges of their *Books*, except, as I have already obſerv'd, thoſe for the Church, and thoſe for the King's Library. Though they have found lately a new Invention to beautify the *Tranche* of their *Books*, which produces as good an Effect, or rather better, than *Gold* it ſelf; which is marbling it, in the ſame beautiful Manner we do our marble Paper, thus;

They have a Trough of about four Fingers deep, of the Length and Breadth of the largeſt Volume, to contain the Liquor, which Liquor is a Quarter of a Pound of Gum Tragacanth macerated four or five Days in fair Water, and ſtirr'd from Time to Time, adding every Day freſh Water to it, till it be of a Conſiſtence ſomewhat thinner than Oil, and then they ſtrain it through a Cloth into the Trough.

When the Gum is well ſettled in the Trough, they extend a Sheet of Paper, and plunge it very ſhallow into the Liquor, ſuddenly lifting it out again, in order to ſtir up, and raiſe the ſubſiding Gum towards the Surface, and for the more impregnating of the Liquor. Which done, they have all the Colours rang'd in Gallipots on the Table, *viz.* for blue, Indico ground with white Lead; for green, Indico and Orpiment, the one ground, and the other temper'd, mix'd, and boil'd together with common Water; for yellow, Orpiment bruis'd and temper'd; for red, the fineſt Lake ground with Raſpings of *Breſil* Wood, which has been prepar'd by boiling half a Day. Into all theſe Colours they put a little Ox or Fiſh Gall, which is two or three Days old; and if the Colours dilute not of themſelves ſufficiently, they add more Gall; on the contrary, if they ſpread too much, the Gall is over-dos'd, and muſt be corrected by adding more of the Colour without Gall. Then they begin, by dipping a Bruſh of Hog's Hair into any Colour, commonly the blue firſt, and ſprinkle it on the Surface of the Liquor in the Trough, (which is alſo upon the Table) if the Colour were rightly prepar'd, it will dilate it ſelf duly therein. This done, the red is applied in the like Manner, but with another Pencil; and after this the yellow, laſtly, the green. For white, it is made by only ſprinkling fair Water, mix'd with Ox's Gall, over the Liquor.

When all the Colours are thus floating on the Liquor, to give them that fine Cambletting we admire in marble Paper, they uſe a pointed Stick, which being applied, by drawing it from one Side of the Trough to the other with Addreſs, ſtirs up the Liquor and fluctuating Colours; then with a Comb taken by the Head with both Hands, they comb the Surface of the Liquor in the Trough from one Extreme to another, permitting only the Teeth to enter.

The Colours being in this Poſture, the *Book-binder* takes off his *Book* from the Preſs, keeping it cloſely tyed betwixt the two Back-boards, leſt the Colours ſhould penetrate too far into the Inſide of the *Book*, having moiſten'd it firſt, with fair Water, applies each Side, one after another, to the Colours, in ſuch a Manner, that the Surface of the Colours, and that of the Edge of the *Book*, may meet equally on all Parts; the Operation is done in nine or ten Pulſes. Then the *Book* is put to dry, and when dried is poliſh'd with the *Dog's Tooth*, the Ivory Nob, or the like. This is a vaſt Addition to the Beauty of the *Binding*, which being carried thus far, an Ornament of Silk of ſeveral Colours, call'd a *Head-Band*, is plac'd at each Extreme of the Back, a-croſs the Leaves, and wove and twiſted, ſometimes about a ſingle, and ſometimes a double Piece of roll'd Paper.

Then remain the *Covers*, which are either of Calf's Skin, which the *French* call *Relier en veau*; or of Sheep's Skin, which they call *Relier en Baſane*. Antiently *Books* were almoſt all bound in Parchment, and moſt of our valuable *Books*, even ſince the Invention of Printing, have no other *Binding*; but this Practice has been long diſus'd. The beſt *Binding* at preſent is in Calf, though *Binding* in Sheep makes as good a Figure, but is not of ſo long a Duration. The Calf or Sheep-ſkin being moiſten'd in Water, is cut out to the Size of the *Book* with a Knife, then ſmear'd over with Paſte, made of Wheat Flour, and afterwards ſtretch'd over the Paſteboard on the Outſide, and doubled over the Edges within ſide, after having firſt taken off the four Angles, and indented and plaited it at the Head-band; which done, the *Book* is corded, or bound firmly, between two Boards, with a kind of Whipcord, to make the Cover ſtick the ſtronger to the Paſteboards and the Back, as alſo to form the Bands or Nerves more accurately; then ſet to dry, and when dry, uncorded, and the Leaves at each End open'd. Afterwards, the *Book* is waſh'd over with a little Paſte and Water, and then ſprinkled fine with a Bruſh, by ſtriking it either againſt the Hand, or a Stick; unleſs it ſhould be marbled, for then the Spots are to be made larger, by mixing the Ink with Vitriol. Then the Cover is glaz'd twice, with the White of an Egg beaten, (as Painters do their Pictures when they are finiſh'd) and at laſt poliſh'd with a *Poliſhing Iron*, paſs'd hot over the glaz'd Cover.

Thus the Binding of a *Book*, properly ſo called, is finiſhed, unleſs it ſhould be lettered; for then a Piece of red Morocco is paſted on the Back, between the firſt and ſecond Band, to receive the Title in Gold Letters; and ſometimes a ſecond between the next Bands underneath, to receive the Number of the Volume. In *France* they ſeldom bind any Book, without both, if the Work conſiſts of ſeveral Volumes. Which done, the *Book-Binder* ſends his Books to the Gilder, which, in that Kingdom, is a Profeſſion apart; or ſeparate from *Book-binding*. The Gilder makes the Letters on the Back, and the Roſes, Stars, *&c.* between the Bands with Punchions, engraven in Relievo, which they preſs flat down; and the Lines, Embroideries, *&c.* with little Cylinders of Braſs, rolled along by an Iron Ruler, by means of a double Branch; in the Middle whereof they are fitted on an Iron Stay or Axis, that paſſes the Middle of their Diameter. But before they apply any of theſe Tools, they glaze thoſe Parts of the Leather, whereon they are to be applied, lightly over with a Pencil, or Spunge; and when half-dry, lay over them Pieces of Leaf-gold, cut out near the Size; and on theſe ſtamp the Punchions, which are beat down with a Mallet or Hammer, if the Figures be large, and require a great Relievo, as Arms, *&c.* or roll the Cylinders, both the one and the other reaſonably hot. The Gilding thus finiſhed, they rub off the ſuperfluous Gold with a Hare's Foot; leaving nothing covered with Gold, but the Places whereon the hot Tools have left their Impreſſions.

BOOK-KEEPING.

BOOK-KEEPING, is the Art of keeping Accounts, or of recording the Tranſactions of one's Affairs in ſuch a Manner, that the true State of any Part, or of the whole, may be thereby known with the greateſt Exactneſs, Clearneſs, and Eaſe; which Tranſactions either relate to Perſons dealt with, or the Things we deal in, which are either Money or Goods. As to the Perſon we deal with, we muſt endeavour to be always capable to know by our *Books* what he owes us, and what we owe him; and as to the Commodities we deal in, we muſt take Care to keep an Account of the Quantity and Value of every Kind of Effects, we have in our Hands, with the Gain and Loſs on that Subject, within the Time of the Account; as alſo of any Thing whatſoever is received by us, or any Way, for our Account, by our Servants, whether the ſame be Money or Wares; and of every Thing whatſoever is delivered from us, upon any Account, whether Money or Wares.

Books are either kept ſingle, as among Retailers; or double, (called the *Italian* Method) among great Merchants. For ſingle *Book-keeping*; two *Books* are ſufficient, *viz.* a *Journal*, or *Day-book*, and a *Ledger*, or *Poſt-book*. But there are ſeveral others requiſite for keeping *Books* double, *viz.* three eſſential, and thirteen Auxiliaries.

The eſſential ones are, the *Waſte-book*, *Journal*, and *Ledger*. And the Auxiliaries are, the *Caſh-book*, *Debt book*, *Books of Numero's*, *of Envoices*, *of Accompts Current*, *of Commiſſions*, *Orders*, *or Advices*, *of Acceptances*, *of Remittances*, *of Expences*, *of Copies of Letters*, *of Veſſels*, *and of Workmen*.

This Method of *Book-keeping*, in two Parts, or in *Parties double*, as the *French* call it, and which we have learned from the *Italian* Merchants of *Florence*, *Venice*, *Genoa*, &c. is univerſally practiſed throughout all *Europe*, and in the ſame Manner, as to Subſtance, but not as to Coin, which varies according to the Regulation of the Coin of the State, where the Merchants are; for in *England* the *Books* are kept in *Pounds*, *Shillings*, and *Pence*. In *France* in *Livres*, *Sols*, and *Deniers*. In *Spain* in *Maravedis*, ſometimes in *Rials* and Pieces of *Eight*. At *Liſbon*, and throughout *Portugal*, in *Rees*. Throughout moſt Parts of *Germany*, in *Florins*, *Cruitzers*, and *Pennings*. In *Holland*, in *Florins*, *Patars*, and *Penings*. At *Florence*, in *Gold Crowns*, *Sols*, and *Deniers*. At *Venice* in *Ducats*. At *Meſſina* and through *Sicily* in *Ounces*, *Taris*, *Grains*, and *Picolis*. In *Muſcovy*, in *Rupees*, *Altins*, and *Grives*. At *Dantzick*, in *Rixdollars*. At *Hamburgh*, in *Marks*, *Sols*, and *Deniers Lubs*. And through all the States of the *Grand Seignor*, in *Piaſters* and *Aſpers*.

Note, That a *Pound Engliſh*, or Sterling is 20 Shillings, a *Shilling* 12 Pence, and a *Penny* 2 Halfpence, or 4 Farthings; a *Halfpenny* 2 Farthings. A *French Livre* is 20 Sols, a *Sol* 4 Farthings, or *Liards*. A *Maravedi* is half a Farthing *Engliſh*; a *Rial* 6 Pence $\frac{3}{4}$; a *Piece of Eight* 4 Shillings and 6 Pence. A *Rees* is equal to $\frac{3}{5}$ of a Farthing Sterling. A *German Florin* is 3 Shillings. A *Dutch Florin* is 2 Shillings, a *Patard* 1 Halfpenny, $\frac{1}{4}$ of a Farthing. A *Florence Gold Crown* 5 Shillings and 6 Pence. A *Venice Ducat* 4 Shillings and 4 Pence. At *Naples* the *Carlin* is 6 Pence. Through *Italy* the *Sequin* is 9 Shillings and 2 Pence. The *Roup* 4 Pence $\frac{3}{4}$. The *Rix-Dollar* 4 Shillings and 6 Pence. A *Hamburgh Mark* 1 Shilling and 6 Pence. A *Piaſter* 4 Shillings and 6 Pence; and an *Aſper* ſomething more than an *Engliſh* Halfpenny.

The WASTE-BOOK, is an univerſal and compleat Memorial of all the Tranſactions and Events of Buſineſs, taken in the natural Order of Time, wherein all Things of one Date are placed together; ſerving as a Preparation for the *Ledger-Book*, into which they are all to be transferred, upon diſtinct Accompts, according to the Order of Subjects; therefore this *Book* is rather a *Memorial Book*, or a *Memorandum Book* than a *Waſte-Book*, ſince what Relation the Word *Waſte* bears to the Nature of this *Book* is not very obvious.

The *Waſte-Book* may be kept two Ways; the firſt by entring Things down ſimply as they happen; and the ſecond, by entring at once, each Article *Debtor* and *Creditor*. The *Waſte-Book* begins with the Inventory of a Merchant's Effects and Debts; and contains a compleat Record of every Tranſaction of his Affairs, with all the Circumſtances, in a Plain Narration of Matter of Fact; every Tranſaction following another in the Order of the Date. For Example:

The Method of keeping the Waſte-Book.

The *Waſte-Book* of *L. P.* of *London*, Merchant, containing all my Dealings from the firſt Day of *March*, 1741.

In the Name of God, Amen.

AN Inventory taken *March* the firſt, containing all my Eſtate in Caſh, Wares, and Debts, which I have at this Day, and alſo what Debts are owing by me to others, *&c.*

My whole Eſtate, this Day in Money, Wares, and Debts, is 3159 *l.* 10 *s. viz.*

	l.	*s.*	*d.*	*l.*	*s.*	*d.*
Imprimis, I have in ready Caſh —				1540	00	00
Item, I have Druggs, *viz.*						
340 *lb.* of Scammony at 10 *s. per lb.*	170	00	00			
565 *lb.* of Opium at 6 *s. per lb.*	169	10	00			
105 *C.* of Gallingale, at 2 *l. per C.*	210	00	00			
				549	10	00
				2089	10	00

Item,

	l.	s.	d.
Brought over	2089	10	00
Item, I have raw Silk, *viz.*			
440 *lb.* of *Tripoli* Belladine, at 16 *s. per lb.* — 352 00 00			
650 *lb.* of Legee of *Smyrna*, at 12 *s. per lb.* — 390 00 00			
1090 *lb.* in all	742	00	00
Item, I have at *Aleppo* consigned to *Peter Trueman*, my Factor there, these *Norwich* Wares remaining unsold, *viz.*			
18 Ser. Denims, which cost 6 *l.* each — 108 00 00			
30 Grograms at 3 *l. per* Piece — 90 00 00			
40 Barateens at 3 *l.* 5 *s.* each — 130 00 00			
88 Pieces in all, which cost	328	00	00
	3159	10	00
Item, I am indebted to several Persons, *viz.*			
To *Paul Shaw*, due the 3d Instant — 150 00 00			
To *Lewis Arundel*, to ballance his Accompt in my old Ledger — 80 00 00			
To *Charles Rolling*, due the 30th Inst. — 140 00 00			
To *Peter Eaton*, due *September* the 3d — 140 00 00			
	510	00	00

The Method of Entries in the Waste-Book.

September 12, 1741.

Sold *John Nicholson* 300 *lb.* of Scammony for ready Money, at 20 *s.* 6 *d. per lb.* — 307 10 00

Ditto 15.

Bought of *Lewis Arundel* the *Norwich* Wares following, *viz.*

	l.	s.	d.
10 Grograms, at 3 *l. per* Piece	30	00	00
24 Barateens, at 3 *l.* 6 *s. per* Piece	79	04	00
34 Pieces, in all amounting to	109	04	00

Of which I have paid 80 *l.* ready Money, and the Rest, which is 29 *l.* 4 *s.* to be paid in 8 Days,

Ditto 20.

Received Advice from *Peter Trueman*, my Factor, at *Aleppo*, that he has sold to sundry Persons, for my Accompt, 60 Pieces of *Norwich* Wares; the neat Produce of which, as by the Particulars in his Accompt on the File is 1500 Dollars, the Exchange at 4 *s.* 6 *d. per* Dollar, makes Sterling — 337 10 00

Lent *Joseph Arnold* the Sum of 500 *l.* for three Months, for which he is to pay me Interest, at the Rate of 8 *l. per Cent. per Annum.*

So that the Money lent (as entered into the Cash-Book) is — 500 00 00

And the Interest thereof comes to — 10 00 00

Ditto 25.

Sold *James Bold* the following Druggs, *viz.*

	l.	s.	d.
42 *lb.* of Scammony at 20 *s. per lb.*	42	00	00
350 *lb.* of Opium, at 12 *s. per lb.*	210	00	00
392 *lb.* in all for	252	00	00

Of which I have received 160 *l.* and the rest which is 92 *l.* to be paid the 10th of *October* next.

Ditto 30.

Received from my Factor *Peter Trueman*, at *Aleppo* by my Order, and on my proper Accompt, 8 Chests of Myrrh, containing 30 *C.* nett, which at 22 Dollars *per C.* comes to 660 *Dollars*; the Exchange at 54 *d. per* Dollar makes Sterling — 148 10 00

Joseph Arnold has assigned the 80 *l.* due to him from me, for the Ballance of his Accompt in my old Ledger, to *James Bold*, which I have paid to *Ditto Bold* on Demand — 80 00 00

October 5.

Peter Trueman, my Factor, at *Aleppo*, has remitted to me 600 Dollars, payable here at double Usance, by *Paul Grove*, for the Value delivered there to *Mobert Janezwar*, the first of *June* last, the Exchange at 4 *s.* 8 *d. per* Dollar, makes Sterling — 140 00 00

Which Bill is accepted

Ditto 10.

Sold Alderman *Tyson*, Mercer, the following *Norwich* Wares, *viz.*

	l.	s.	d.
10 Grograms, at 3 *l.* 10 *s. per* Piece	35	00	00
24 Barateens, at 4 *l.* 4 *s. per* Piece	100	16	00
34 Pieces at	135	16	00

For which he has given me an Assignment on *Paul Trusty*, to be paid me in 8 Days, which I have accepted.

Sold *Giles Low*, the following raw Silk for ready Money, *viz.*

	l.	s.	d.
350 *lb.* of *Tripoly* Belladine, at 30 *s. per lb.*	525	00	00
650 *lb.* of Legee, at 25 *s. per lb.*	812	10	00
1000 in all, at	1337	10	00

The *Journal-Book*, is nothing else but a compleat Transcript of the *Waste-Book*, without any Alteration; and is kept by only leaving, on the Left Side of every Page, a large Margin, about a third Part of the Page; on which, against every Transaction, is to be written the Names of the Debtors and Creditors of that Transaction, with their Titles of Debtors and Creditors, and Sums of Money; observing, that where there are sundry Debtors and Creditors, to one Creditor or Debtor they write their Names next each other; and the Name of the one corresponding Debtor or Creditor against the Total of the other Sums; by which Means, the Ballance and Connection appears at Sight. Then when the Transaction is transferr'd to the *Ledger*, they write on this Margin the Numbers of the *Folio's* where the Accompts stand in the *Ledger*, to be examin'd by the Rules of the *Ledger*, thus:

The Entry of the Inventory in the Journal.

The *Journal* of *L. P.* of *London*, Merchant, containing all my Dealings from the 1st Day of *March*, 1741.

In the Name of God, Amen.

AN Inventory taken the first of *March* of my present Estate in Money, Wares and Debts, this Day owing to me; and what Debts are owing by me, *&c.*

Fol. Ledg.		l.	s.	d.
	Sundry Accompts are Debtor to Stock, in the Sum of 3159 *l.* 10 *s.* for so much Cash, Wares, and Debts, owing to me this Day, *viz.*			
1	Cash for so much in Chest — —	1540	00	00
2	Druggs, *viz.*			
1	340 *lb.* of Scammony, at 10 *s. per lb.* — 170 00 00			
	565 *lb.* of Opium at 6 *s. per lb.* — 169 10 00			
	105 *C.* of Gallipgale at 2 *l. per C.* — 210 00 00			
		549	10	00
3	Raw Silk for 1090 *lb. viz.*			
1	440 *lb.* of *Tripoly* Belladine at 16 *s. per lb.* — 352 00 00			
	650 *lb.* of Legee of *Smyrna* at 12 *s. per lb.* — 390 00 00			
1	1090 in all at	742	00	00
1	Voyage to *Aleppo* consigned to *Peter Trueman*, my Factor there, for *Norwich* Wares remaining yet unsold, *viz.*			
	18 Serge Denims, that cost 6 *l.* each — 108 00 00			
	30 Grograms at 3 *l. per* Piece — 90 00 00			
	40 Barateens at 3 *l.* 5 *s.* each — 130 00 00			
	88 Pieces in all, which amounts to —	328	00	00
		3159	10	00

Stock

		l.	s.	d.
Jan.	Stock is Debtor to ſundry Accompts 510 *l.* Due to ſundry Perſons, *viz.*			
	l. s. d.			
3	To *Ezekiel Scrape*, due the 3d Inſt. 290 00 00			
4	To *Benjamin Strikewell* for the Foot of his old Accompt 80 00 00			
	To *James Bold*, due the 1ſt Inſt. 140 00 00	510	00	00

The Method of Journal *Entries.*

March 2d, 1741.

1 2	Caſh, Debtor to Druggs, for 300 *lb.* of Scammony, ſold *George Dean*, for ready Money, at 20*s.* 6 *d. per lb.*	307	10	00

Ditto 10.

1	*Norwich* Wares, Debtor to ſundry Accompts 109 *l.* 4*s.* for 34 Pieces bought of *Marmaduke Price*, viz.			
	l. s. d.			
	10 Grograms at 3 *l. per* Piece 30 00 00			
	24 Barateens at 3 *l.* 6*s.* each 79 04 00	109	04	00
	l. s. d.			
1	To Caſh, paid *Ditto Marmaduke*, in Part 80 00 00			
2	To *Ditto Marmaduke*, to pay him the 25th Inſtant 29 04 00	109	04	00

Ditto 15.

1	*Peter Trueman*, at *Aleppo*, my Accompt Current, Debtor to Voyage to *Aleppo*, conſigned to *Ditto Trueman*, the Sum of 337 *l.* 10*s.* for the Neat Proceed of Wares ſold, as *per* his Account for 1500 Dollars, the Exchange at 54 *d.* Sterling, *per* Dollar, makes *Engliſh* Coin	337	10	00
3	*George Dean* Debtor to ſundry Accompts the Sum of 510 *l.* for 500 *l.* lent him, at Intereſt, for 3 Months, at 8 *l. per Cent. per Annum*, viz.			
	l. s. d.			
1	To Caſh, for the principal lent 500 00 00			
3	To Profit and Loſs for Intereſt 10 00 00	510	00	00

Ditto 19.

2	Sundry Accompts Debtor to Druggs, the Sum of 252 *l.* for 392 *l.* ſold *Joſhua Mackrel*, as follows			
	l. s. d.			
	40 *lb.* of Scammony at 21 *s. per lb.* 42 00 00			
	350 *lb.* of Opium at 12 *s. per lb.* 210 00 00	252	00	00
	(Viz.)			
1	Caſh for 160 *l.* received in Part of *Ditto Mackrel.*			
2	*Ditto Mackrel* Debtor 92 *l.* he is to pay me the 30th Inſtant.			

March 20, 1741.

2	Druggs, Debtor to *Peter Trueman*, at *Aleppo*, my Accompt current 148 *l.* 10*s.* for 8 Cheſts of Myrrh, poize Neat 30 *C.* at 22 Dollars, *per C.* makes 660 Dollars, the Exchange at 54 *d. per* Dollar, is Sterling	148	10	00
2 1	*Paul Grove* Debtor to Caſh, the Sum of 80 *l.* being the Ballance of an Accompt due to him, which I have paid *Marmaduke Price*, by Aſſignation of *Ditto Grove*	80	00	00
2 1	*John Gilbert*, Debtor to *Peter Trueman*, at *Aleppo*, my Accompt current, 600 Dollars, by Bill remitted to me by *Ditto Trueman*, payable at double Uſance, for the Value delivered there, to *Maboat Janeſwar*, the Exchange at 4*s.* 8 *d. per* Dollar, is in *Engliſh* Coin	140	00	00

		l.	s.	d.
Jan.	*Ditto* 30.			
2 1	*Peter Jones*, Debtor, to *Norwich* Wares, the Sum of 135 *l.* 16*s.* for 34 Pieces ſold Alderman *Trader*, *viz.*			
	l. s. d.			
	10 Grograms at 3 *l.* 10*s. per* Piece 35 00 00			
	24 Barateens at 4 *l.* 4*s. per* Piece 100 16 00	135	16	00
	For which Sum *Ditto Jones* has given me his Bill, payable in 8 Days, by Aſſignation of *Ditto Trader.*			
1 3	Caſh, Debtor to Raw Silk 1337 *l.* 10*s.* for 1000 *lb.* ſold to *Simon Strutt* for ready Money, *viz.*			
	l. s. d.			
	350 *lb.* of *Tripoly* Belladine at 30*s. per lb.* 525 00 00			
	650 *lb.* of Legee at 25*s. per lb.* 812 10 00	1337	10	00

By an Ordonnance of the Year 1673, all Traders, in *France*, whether by Wholeſale or Retail, are obliged to keep a *Journal*, containing all their Affairs, Debts active and paſſive, Bills of Exchange, *&c.* for want of keeping this, and ſurrendering it up, they are to be reputed fraudulent Bankrupts, and ſubjected to the Penalties thereof.

The LEDGER, or *Ledger-Book*, or *Great-Book*, or *Poſt-Book*, is a large Volume, containing all the Tranſactions of a Man's Affairs, in ſuch Order, as that thoſe belonging to every different Subject lie together in one Place, making ſo many diſtinct, or ſeveral Accounts, which are extracted either immediately from the *Waſte-Book*, or from the *Journal*, and ſtated in the *Ledger* (which is uſually rul'd in ſix Columns) in *Debtor* and *Creditor*; which to accompliſh, two Pages are requir'd, oppoſite to each other; that on the Left ſerving for *Debtor*, the other for *Creditor*; each Article to conſiſt of five Parts, or Members: The Date; the Perſon whom we credit, or are credited by; the Thing credited, or indebted for; the Page where it is found; and the Sum, or Amount of the Article.

M. *Malcome* preſcribes the following Rules for the Management of the *Ledger*.

1. He will have a certain ſeparate Place allow'd for every Perſon with whom we deal, on mutual Truſt and Credit, or who becomes our Debtor, or we his, as well as for every Thing we deal in, wherein are to be written all, and only the Tranſactions relating to that Subject; whoſe Name is to be inſcrib'd or written on the Head thereof; making thereby diſtinct particular Accounts.

2. Every Account is to be diſtinguiſh'd into two Parts, taking for each an equal Portion (leſs or more, as you think fit) of Right and Left Pages, of one *Folio*, or Opening, the Name of the Subject being written on the Account, on both Sides, which are diſtinguiſh'd by the Words *Debtor* on the Left Side, and *Creditor* on the Right, for the Uſes following. 3. Every perſonal Account to contain, on the Debtor Side, all the Articles which that Perſon owes you, and the Payment you make of your Debts to him; and on the Creditor Side all that you owe to him, and the Payments he makes of his Debts to you. 4. Every real Account to contain, on the *Debtor* Side, the Quantity and Value of what was upon Hand, at the Beginning of the Account, and what was afterwards receiv'd, with all Coſts and Charges; and on the *Creditor* Side the Quantity and Value of what was upon Hand at the Beginning of the Account, and what was afterwards receiv'd, with all Coſts and Charges; and on the *Creditor* Side the Quantity and Value of what is diſpos'd of, or in any Manner taken away, or gone out of it, with all the Returns that Subject makes you. 5. Every Tranſaction muſt be enter'd in the *Ledger-Book*, with a Ballance of Debt and Credit, *i. e.* ſo that every Article be plac'd on the *Debtor* Side of one Account, and the *Creditor* Side of ſome other, making thereby, equal Debt and Credit in the *Ledger*; and where the perſonal and real Account concern'd in

the Tranſaction do not, in the Articles belonging to them, make this Ballance, (as they will in moſt Caſes) then ſome imaginary Account muſt be us'd to ſupply the Defect. 6. Thoſe Accounts, whoſe Articles of Debt and Credit, in any Tranſaction, ballance one another, are, in the *Ledger*, to be connected together in the Style of every Article, as mutual and correſpondent *Debtors* and *Creditors*; by writing in each of the correſponding Accounts the Name of the other after the Particle *to* in the *Debtor*'s Account, and *by* in the *Creditor*'s, which connect the two; the Name of the Account, in which Articles are written, with its Quality of *Debtor* and *Creditor*, being underſtood as join'd to, and ſo is read before, the Word *to* or *by*, in every Article, (though it be written only, once for all, upon the Head of the Account) then after the Name of the correſponding *Creditor* or *Debtor* follows a brief Narration of the Fact, the Date and other Numbers being plac'd in their proper Columns. Hence we find the Uſe of the Column which ſtands within the Money Column, which is this, to write in it the Number of the *Folio* where ſtands the correſponding Account, with which the Account, in which you write, is connected, in every Article. For Example, thus;

London, Anno Domini, 1741.

			Fol.	*l.*	*s.*	*d.*
		GEORGE DEAN, *Debtor.*				
1741 *March*	1	To Sundry Accompts for Principal, and Intereſt	1,3	510	00	00
		Profit and *Loſs*, *Debtor*				
1741 *March*	10	To Houſhold Expences	4	149	08	06
	10	To Charges on Merchandiſe	4	92	15	11
		To Stock gained by 1 Month's Trade	1	896	10	01
				1138	14	06
		John Stone, *Debtor.*				
1741 *March*	15	To Caſh paid him in full		140		
		Joſeph Perkins, *Debtor.*				
1741 *March*	5	To Caſh paid him in full	1	150		
		Raw Silk, *Debtor.*				
1741 *March*	3	To Stock 1090 *l.*	1	742		
		To Profit and Loſs gained by this Account	3	667	10	
				1409	10	00

London, Anno Domini, 1741.

			Fol.	*l.*	*s.*	*d.*
		Per Contra Creditor.				
1741 *March*	20	By Ballance due to me	4	510		
		Per Contra Creditor.				
1741 *March*	12	By *George Dean*, for Intereſt of 500 *l.* due *October* 15.	3	10		
	15	By *Norwich Wares* gained thereby	1	26	12	
		By Voyage to *Aleppo* gained thereby	1	150	02	06
		By Druggs gained thereby	2	284	10	
		By Raw Silk gained thereby	3	667	10	
				1138	14	06
		Per Contra Creditor.				
1741 *March*	25	By Stock	1	140		
		Per Contra Creditor.				
1741 *March*	1	By Stock	1	150		
		Per Contra Creditor.				
1741 *March*	30	By Caſh 1000 *l.*	1	1337	10	
		By Ballance then left unſold of *Tripoly* Belladine 90 *l.*	4	72		
				1409	10	00

To your *Ledger* you muſt have an Alphabet, for the ready finding every Account, whether proper, or factorage, domeſtick or foreign; as Men, Wares, Voyages, Profit, and Loſs, Accounts current, *&c.* the Method whereof let be thus, of having a Page for, as there is Occaſion for each Letter. Generally it is the Letter of a Man's Sirname, and the proper Name of the Thing, or Commodity, that directs its Place in the Index.

Thus,

The *Debt-Book*, or *Book* of Payments, is a *Book* wherein is enter'd the Day whereon all Sums fall due, whether to be paid or receiv'd by Bill of Exchange, Merchandiſe, or otherwiſe; to the End, that by comparing Receipts and Payments, Proviſion may be made in Time for a Fund for Payments, by receiving Bills, *&c.* or taking other Precautions. This *Book*, like the *Ledger*, muſt be on two oppoſite Pages, Money to be receiv'd on the Left Hand, and that to be paid on the Right. Thus,

June	1741	To Pay	l.	s.	d.
6	To *Matthew Sulivan*, for Money lent *Jan.* 1.		500	00	00
	To *Joseph Plumtree*, a Note under Hand of *May* 2.		200	00	00
8	Remittance of *Trueman*, of the 30th of *November*, to *Grove*		1000	00	00
	My own Bill of the 30th of *September* to Bearer		800	00	00

June	1741	To Receive	l.	s.	d.
10	Remittance of *Peter Trueman* of the 20th of *May*		1700	00	00
20	Of *George Dean* for Druggs, sold the 30th of *January*		300	00	00
25	Of *Simpson Pickthread* for *Norwich* Wares, sold *February* 3.		150	10	03
	Of *Paul Grove*, for Money lent *May* 12		225	11	08
	Of *Peter Price*, for Money paid on his Account *June* 6.		50	15	00
	Of *Jonah* for 200 *lb.* of Opium, sold *Jan.* 1.		25	12	00

The *Cash-Book*, is the *Book* wherein are enter'd all the Sums receiv'd and paid daily; those receiv'd on the Left Hand, with the Person's Name of whom receiv'd, for what, for whom, and in what Specie; those paid on the Right, mentioning likewise, the Specie, the Reason why, the Person to whom, and for whom the Payment is made; and once in a Month, or oftener, sum up your Account of Cash receiv'd and paid, carrying the Sum to the Account of Cash in the *Ledger*, which Account, without this Book, would swell too big, provided you should enter the Particulars there. For Example,

CASH-BOOK.

June	1741	*Cash Debtor.*	l.	s.	d.
6	Received for 300 *l.* of Scammony, sold *George Dean*, in Guineas.		307	10	
8	Received in Part, of *William Short*, in Pieces of Eight		160		
	Received in full, for Raw Silk, of *Joseph Grove*, in Moidores		1337	10	
	Received in full, of *Peter Price*, Part in Moidores and Part in Guineas		92		
	Carried to Folio 1 in the Ledger		1896	—	—

June	1741	*Cash Creditor.*	l.	s.	d.
7	Paid in full, to *John Baker*, in Guineas,		150		
12	Paid in part, for *Norwich* Wares, to *Paul Grove*, in Thirty-six Shillings, *Portugal* Pieces		80		
15	Lent *Peter Price*, in Guineas, at Interest for three Months		500		
20	Paid *Lewis Stone*, in Pieces of Eight, by Assignation		80		
25	Paid to *Ditto Lewis*, in Guineas and in full,		29	04	
27	Paid *Charles Stanyan*, in Shillings and Crown Pieces		140		
30	Paid *Joseph Grove*, in part, in Pieces of Eight		31		
31	By Houshold Expences this Month, from Folio 1.		149	08	6
	By Charges on Merchandize, this Month, as on Folio 1.		92	15	11
		Carried to the *Ledger*, Folio 1.	1252	08	05

The Cash Account in the *Ledger* is necessary for the Ballance of the whole; and the Convenience of the separate Accounts of all the Particulars is, that we have them all together, in one continu'd Account; whereas the Rule of the *Ledger* being not to allow more than one *Folio* for one Account, till that be fill'd up, the Account might hereby lie in several different *Folio's*.

The *Book* of ENVOICES, is to keep an Account of Goods, Ships, either for your Account, or for others in Commission, according to the Bills of Lading; with the whole Charges, till on Board; every *Envoice* following another, according as they happen, *i. e.* entering the Goods sent or shipp'd off to be sold, for your Account, with the Value, and Time when sent, on the Left Hand *Folio*; and entering the same on the Right Hand *Folio*, as you receive Advice of their Sale: So you may readily see how the Account stands in that Particular. Thus,

Envoice *of Goods shipp'd on Board the* America Sloop, *Burthen* 250 *Tuns*, Peter Brown *Master*, *bound for* Genoa; *the following Goods, consign'd to* William Stockwell, *for my Account, or by Order and the Account of* James Price, *and Company.*

The FACTOR-BOOK, is number'd and distinguish'd into *Folio's*, like the *Ledger*; on the Left Hand Side is written, in a plain Narrative, an Account of the Goods receiv'd, with all Charges; and on the opposite Side an Account of all the Sales and Disposals of those Goods: So that this is only a Copy of the Employer's Account of Goods in the *Ledger*, in the Stile of the *Waste-Book*.

If the *Factorage* be in domestick Trade, *i. e.* if the Factor, or his Servants, manage the Accounts for the Employer, whom he serves in Commission, he must observe the following Rules:

1. If the Factor receives Wares for his Employer, he must make the Accounts of Goods for his Employer Debtor to Cash, for so much paid Custom, Freight, *&c.* at the Receipt. Then make Cash Creditor, by Accounts of Goods so much as paid.

2. When Wares receiv'd in Commission, are sold, by the Factor, for ready Money; then Cash becomes Debtor to Account of Goods, for the Employer the Sum receiv'd. Therefore Accounts of Goods must be made, for the Employer Creditor, by Cash, the same Sum.

3. When Wares, in Commission, are sold Part for ready Money, and Part at Time; then the Buyer is made Debtor to Accompt of Goods, for Accompt of the Employer, the Sum left unpaid; and the Cash Debtor to Accompt of Goods for the Sum receiv'd.

4. When Wares are sent to the Employer, in Return, with Charges in shipping off, the Accompt of Goods for Accompt of the Owner, naming his Name, his Accompt current, is made Debtor to the Goods shipp'd, naming the Value, and Goods, with the Ship's and Master's Name, *&c.* Also, the same Accompt is made Debtor to Cash, paid for Custom, and other Charges. Then Wares shipp'd are made Creditor by the Employer, his Account current, for the Value. And Cash Creditor by the same Accompt current, for the Charges of shipping off. But if these Goods shipp'd were bought by Order, and on the Accompt of the Employer for ready Money, and not enter'd before in your *Ledger*, you are to make your Employer, by Name, his Account current, Debtor to Cash for the Value of the Goods, and Charges for shipping off. And Cash Creditor *per Contra*.

5. When a Bill of Exchange is drawn on a Factor, by his Employer, payable at Time; the Factor makes his

his Employer at ſuch a Place, his Accompt current, Debtor to whom the Bill is payable for the Content thereof; then makes him by Name, to whom the Bill is payable, Creditor, by his Employer, his Accompt current, for the ſame Sum. But if the Bill had been paid to Order of the Employer, by the Factor preſently, the Employer Account current, had likewiſe been made, Debtor to Caſh, for the Sum paid to *Peter* ſuch a one, or the like; and Caſh Creditor, by the contrary, for *Ditto* Sum. The Entry is the ſame with this laſt, when the Factor remits ready Money to his Employer.

But if the Factorage be in foreign Trade, *i.e.* if a Factor cannot carry on the Buſineſs of thoſe whom he ſerves in Commiſſion, without Aſſiſtance of foreign Correſpondence, for whoſe Returns he muſt be accomptable to his Employer, he muſt likewiſe obſerve theſe other following Rules.

1. If Goods ſent to Sea are inſur'd by him, he muſt make the Voyage to ſuch a Place; to *Leghorn*, for Inſtance, for the Account of *Peter de Lorme*, the Employer, conſign'd to *Peter Trueman*, Factor, Debtor; or to Caſh, if he pays the Inſurance Money preſently, and Caſh Creditor by Voyage, *&c.* But if the Inſurance Money was not to be paid preſently, then Voyage to *Leghorn*, &c. is made Debtor to the Inſurer, and the Inſurer Creditor by Voyage.

2. When Goods are ſhipp'd by a Factor, by Order of his Employer, to his Factor in another Country, he is to make Voyage to ſuch a Place for Accompt of his Employer, conſign'd to his Factor, by Name, Debtor to his Employer, his Accompt of Wares, for Charges at the Receipt of the Goods. And to Caſh for Charges of ſhipping. Then make *per Contra* Creditor, the Accompt of Wares and Caſh.

3. When the Factor receives Advice that the Wares are ſold which were ſent to his Factor, then he makes Factor, at ſuch a Place, for Accompt of his Employer, Debtor to Voyage to ſuch a Place, for *Ditto* Accompt, for the neat Produce, as by Advice. Then make Voyage to ſuch a Place, for Accompt of his Employer, Creditor, by Factor, at ſuch a Place, for Accompt of his Employer.

4. When a Factor is to enter his Proviſion, for Wares ſold on a foreign Accompt, he makes Voyage to ſuch a Place, where the Factor reſides, for Accompt of his Employer, Debtor to Profit, and Loſs, for ſo much as his Proviſion, or Money for his Employment amounts to, as by his Agreement. Then make Profit and Loſs Creditor, by Voyage, to the Place his Factor lives at, for Accompt of his Employer for the ſame Sum.

5. When a Factor receives Advice that his Factor has made Abatement for Defects in Goods, that he formerly ſold, then he makes Voyage to ſuch a Place, for Accompt of his Employer, Debtor to Factor, at ſuch a Place, for Accompt of his Employer, ſo much as abated. And makes Factor, at ſuch a Place, for Accompt of his Employer, at ſuch a Place, Creditor, by Voyage to the Place his Factor lives at, for Accompt of his Employer for the ſame Sum.

Note, That when a Factor cloſes the Accompt of Wares ſold by his Factor, with his Returns, *&c.* for Accompt of his Employer, he muſt make Voyage to his Factor, for Accompt of his Employer, Debtor, to his Employer's Accompt current, for the Ballance thereof. And contrary Creditor by Voyage to ſuch a Place, for Accompt of his Employer, for the ſame Sum. When a Perſon does little in Commiſſion, a ſeparate *Factor-Book* is needleſs.

Book of Account current, is kept in Debtor and Creditor, like the *Ledger*; and ſerves for Accounts ſent to Correſpondents to be regulated in Concert with them, e're they are enter'd in the *Ledger*. This is properly a Duplicate of the Accounts current, kept to have Recourſe to, on Occaſion.

Book of Acceptances, is deſtin'd for the regiſtring all Bills of Exchange, notified by Letters of Advice from Correſpondents; to be able to know, on the Bills being preſented, whether they have Orders to accept them, or not. When they chuſe to decline accepting a Bill, againſt the Article thereof, in the *Book*, they put *P*, *i. e. Proteſt*; that on offering the Bill the Bearer may be told he may proteſt it: On the contrary, if they accept it, they write againſt it an *A*, adding the Date or Day of Acceptance. And this, upon being transferr'd to the *Debt Book*, is cancell'd.

Book of Remittances, ſerves to regiſter Bills of Exchange, or they are remitted by Correſpondents, to require the Payment thereof. If they be proteſted for want of Acceptance, and return'd to thoſe who remitted them, mention is made thereof againſt each Article, by adding a *P* in the Margin, and the Date of the Day when they were return'd, then cancell'd. The *Books* of *Acceptances* and *Remittances* have ſo near a Relation to each other, that many Merchants make but one of the two, which they keep in Debtor and Creditor; putting Acceptances on the Side of Debt, and Remittances to that of Credit.

The *Book of Expences*, is a Detail of the petty Expences, both domeſtick and mercantile; which at the End of each Month are ſumm'd up, and make an Article for the *Caſh-Book*; and to the Profit and Loſs Account in the *Ledger*; which is Debtor to Caſh for it. Thus,

Houſhold Expences, Debtor.

May	1741	*l.*	*s.*	*d.*
9	To Caſh paid *Paul Grove*, for one Quarter's Rent of my Dwelling-Houſe, due at *Midſummer-Day* laſt, in full	40	10	
5	To Caſh for my Pocket Expences	4		
10	To Caſh paid my Wife for Apparel, *&c.*	50	14	
20	To Caſh paid *Abigale Pilfer*, the Houſekeeper, for this Month	50	4	6
25	To Caſh paid for my Children at School	50		
27	To Caſh paid to my Taylor	15		
30	To Caſh for my Pocket Expences	4		
	Carried to Caſh-Book, Folio 1.	214	8	6

Book of Numero's, or *Wares*, is kept for the eaſy Knowledge of all the *Goods* brought in, ſent out, or remaining in a Warehouſe. On the Left Hand Page are enter'd the Quantity, Quality, and Number or Mark of the *Goods* brought in; on the Right, the Diſcharge of the *Goods* out of the Warehouſe, againſt the reſpective Articles of the firſt. Thus,

N° 1.	A Bale of white Paper, weighs	400*l*
2.	A Piece of Crimſon Damaſk, Ells	63.

March 1.	Sold to *Joſeph Grove.*	
April 2.	Sent to *Peter Price.*	

Month-Book, is number'd in *Folio's*, like the *Ledger*, and divided into Spaces; on the Top of each of which are the Names of the twelve Months of the Year, *January*, *February*, &c. allowing a whole *Folio*, or what you pleaſe, to each Month; and a different Set of 12 Spaces for every different Year. On the Left Page, enter the Payments to be made to you, in that Month; and on the Right Hand Page the Payments you are to make. Make a Column, likewiſe, on the Left Hand of every Page, in which write the Day of Payment; and after this the Name of the Debtor, or Creditor; and draw the Sum into the Money Columns.

Book of Veſſels, is kept in Debtor and Creditor; a particular Account being kept for each Veſſel. To the Side of Debtor are put Victualling, fitting out, Wages, *&c.* to the Side of Creditor are put every Thing the Veſſel has produc'd, whether by way of Freight, or otherwiſe. Laſtly, the Total of each is enter'd

enter'd in the *Journal*, upon ballancing the Accompts of each *Veſſel*.

Book of CARGO, or *Loading*, *Livre de bord*, is kept by a Clerk of a Ship, in *France* call'd the *Eſcrivain*; wherein are enter'd all the Goods a-board the Veſſel, whether thoſe for Freight, or for Sale, or Exchange; the whole according to the Specification in the Maſter's Bills of *Loading*.

Book of Workmen, is particularly in Uſe among Manufacturers, who have conſiderable Works in their Hands. It is kept Debtor and Creditor for each *Workman* employ'd. On the Side of Debt is put the Matters given them to *work*; and on that of Credit, the *Work* they return.

In Cities where there are publick Banks, as at *Venice*, *Amſterdam*, *Hamburgh*, and *London*, there is a *Bank Book*, wherein is kept an Account of the Sums paid to, or receiv'd from the *Bank*.

Book of Rates, is a ſmall Book eſtabliſh'd by Parliament, declaring at what Value Goods that pay Poundage (or $\frac{1}{20}$ Part of the Value) ſhall be reckon'd, ſo that a 20th Part of the Sum found in the Book of *Rates* is taken for the Duty payable by the Acts of Tunnage and Poundage.

Book of Charges on Merchandiſes, is kept to enter the Charge of Cuſtom, Freight, Warehouſe-Room, Poſtage of Letters, Porterage, Cartage, Wharfage, Books of Accompts, *&c.* and once in a Month the Merchant, or Book-keeper, muſt make a Sum, and transfer it into the Creditor Side of his *Caſh-Book*, making a Reference to the *Folio* of the Book of *Charges on Merchandiſe*; and alſo into the Debtor Side of the Account of *Charges on Merchandiſe* in his *Ledger*. This Book is kept thus:

Charges on Merchandiſe, Debtor.

		l.	*s.*	*d.*
May	1741			
1	To Caſh paid *James Jones*, for a Quarter's Rent of my Ware-Houſe, due at *Midſummer-Day* laſt, and is in full	10	00	00
5	To Caſh paid for Poſt-Letters	00	10	00
7	To Caſh paid for *Ditto*	00	12	4
10	To Caſh paid Freight of 8 Cheſts of Myrrh	70	00	00
	To Caſh paid Cuſtom of *Ditto* Myrrh	10	14	00
15	To Caſh paid Wharfage, Crainage, *&c.* of *Ditto*, at 5 *d. per* Cheſt	00	3	4
	To Caſh paid, Cartage of *Ditto* from the Key	00	6	00
30	To Caſh paid Porterage this Month	00	6	3
	To Caſh paid Demurrage	00	4	00
	Entered in *Caſh-Book* Folio 1.	92	15	11

Beſides theſe *Books*, a Merchant ought to have a *Book* wherein to enter a Copy of all Letters he ſends, or receives, upon Account of Trade. Alſo, a *Pocket-Book*, to take the Minutes of what Buſineſs he tranſacts Abroad, to eaſe his Memory, and to avoid Error.

When a Stock is employ'd in common, between ſeveral Merchants, in the Way of Trade, and each Partner is to have a Share of the Gain, or bear a Share of the Loſs, in Proportion to his Share in the Stock, 'tis call'd *Company Accompts*; which are kept in the following Manner:

1. When Goods are bought, and paid for, by your ſelf, for Company Account; you are to make Wares in the Company between the Partner and you (naming your ſeveral Shares of the Stock) Debtor to Caſh for the Value of the Goods, *&c.* and Caſh Creditor, by Wares, in Company between Partner and you for the ſame Sum. Then make your Partner, by Name, his Account current, Debtor to *Ditto* Partner's Account, in Company, for his Share of the Stock; and his Account in Company Creditor by his Account, and current for the ſame Sum. The Entry is the ſame, if the Goods are bought in Truſt, if inſtead of Caſh you make the Goods Debtor to the Seller, and him Creditor by the ſame.

2. When you receive your Partner's Share of Caſh for the Goods bought in Company, you make Caſh Debtor to your Partner his Account current for the Sum he paid you; and his Account current Creditor by Caſh for the ſame Sum.

3. If you have the Management of the Account in Company, and give an Aſſignment to a Creditor, upon your Partner for his Share of Goods bought in Company, you muſt make the Receiver Debtor to your Partner, his Account current, for the Sum in the Aſſignment; and the Partner's Account current Creditor by the Demander for the ſame Sum.

4. When you receive ready Money for Goods ſold in Company, you make Caſh Debtor to Wares in Company, (always naming the Wares) between your Partner and you, (naming his Name, and each of your Shares) for ſuch Goods, ſold to ſuch Perſon, for ſo much. And Wares, in Company between ſuch a one and you Creditor by Caſh, for the ſame Sum. Then you are to make Partner's Account, in Company, Debtor to his Account current, for his Share of the Caſh receiv'd; and Partner's Account current Creditor, by his Account, by you in Company, for the ſame Sum. If theſe Wares had been ſold at Times, the Entry had been much the ſame, if inſtead of making Caſh Debtor *to* Wares *in* Company, you make the Buyer Debtor to the ſame Wares; and Wares in Company Creditor by the Buyers, *&c.*

5. When Goods are ſold in Company, Part for ready Money, and Part at Time, you are to make Caſh Debtor to Wares in Company, between your Partner and you, for the Money receiv'd in Part; and the Buyer Debtor to the ſame Account for the Money left unpaid; then make Wares in Company, between your Partner and you, Creditor, by ſundry Accounts, (referring to the *Folio's* of Caſh) and the Buyer's Account, for the whole Value of the Goods ſold. You muſt alſo make your Partner's Account, in Company, Debtor to his Account current, for his Share of the whole Value of the Wares ſold; and your Partner's Account current, *&c.* by his Account by you, in Company, for the ſame Sum.

6. When you bring, into Company, Wares of your own, that are enter'd in your *Ledger*; you make Wares in Company (the Wares nam'd) between your Partner and you, Debtor to Wares, by Name again, in the Sum you bring them into Company for, naming for what Quantity, Price, *&c.* then you are to make Wares, as before enter'd in your *Ledger*, Creditor, by the ſame Wares in Company, between your Partner and you, for the Quantity brought into Company, at ſuch a Price. And then make Partner his Account current, Debtor to your Partner's Account in Company, for ſo much Goods brought into Company by you, of which his Share of the Price is ſo much. Laſtly, make Partner his Account in Company Creditor, by his Account current for his ſaid Share.

7. When Wares, bought for Company's Account, and book'd, are ſhipp'd off to be ſold for the ſame Company's Account, you muſt make Voyage to the Place whither the Ship is bound, (naming the Factor the Wares are conſign'd to) in Company between your Partner and you, Debtor to Goods ſhipp'd for their Value, to Caſh for Charge of ſhipping, ſo much as paid for that; then make Wares in Company, between your Partner and you, Creditor by Voyage, in Company between you, for their Value; and Caſh Creditor, by Charges of ſhipping. Then make your Partner his Account current Debtor to his Account in Company, for his Share of the Charges of ſhipping off; and *Ditto* Partner his Account in Company, Creditor by his Account current, for the ſame Sum.

8. When Wares are bought, on Company Account, to be paid for at a Time; and are ſhipp'd off, and Charges paid before Entry, you muſt make Voyage to ſuch a Place, in Company between your Partner and you, conſign'd to your Factor, Debtor to the Seller for the Value of the Wares, and to Caſh, for the Charges of ſhipping; then make the Seller Creditor by Voyage to ſuch a Place, in Company between your Partner and you, conſign'd to your Factor, for the Value of the Goods ſhipp'd; and Caſh Creditor, by Voyage, in Company, between your Partner and you,

conſign'd to your Factor, at ſuch a Place, for the Charge till on Board. Make, alſo, Partner his Account current, Debtor to *Ditto* Partner's Accompt in Company, for his Share of the Value of the Wares, and Charges till on Board. And his Accompt in Company, Creditor by his Account current, for the ſame Share of the Value and Charges of ſhipping. But if the Wares bought, in this Caſe, had been paid for in ready Money, the Entry would be the ſame, with this Difference only, that whereas, firſt, Voyage in Company, *&c.* is made Debtor to the Seller, and he Creditor by Voyage, *&c.* you muſt make Voyage, in Company, *&c.* Debtor to Caſh for the Value and Charges; and Caſh Creditor by Voyage for the ſame Sum.

9. When you receive Advice that Wares for Company Account are ſold by your Factor; you muſt make Factor at ſuch a Place for Company Account between your Partner (ſo much of the Stock) and ſo much you your Accompt current, Debtor to Voyage to ſuch a Place, in Company, between your Partner and you, (naming your Shares) conſign'd to *Ditto* Factor, for the neat Produce, as by Advice. And Voyage to ſuch a Place, in Company between your Partner and you, (naming your Shares of the Stock) conſign'd to ſuch a Factor, Creditor by Factor, at ſuch a Place, for Company Account between your Partner and you, your Account current for the ſaid neat Produce.

10. When you receive Advice that your Factor has made Abatement for Defect in Goods ſold, between your Partner and you, in Company; you are to make Voyage to —— in Company, between your Partner and you, (naming always your Shares after the Name) conſign'd to Factor, Debtor. To *Ditto*, Factor, for Company Account, between your Partner and you, for the Defect. Then Factor at ſuch a Place, for Company Account between your Partner and you, (your Account current) Creditor, by Voyage to——in Company between your Partner and you, for the ſame Sum abated.

11. When Money is remitted to you, by your Factor, for Wares ſold, for Account of Company, and by you received, make Caſh Debtor to Factor at —— for Company Accompt, between your Partner and you, your Accompt current, for the Money receiv'd by Bill; and Factor for Company Account, between your Partner and you, your Accompt current Creditor by Caſh, for the ſame Sum. Then make your Partner's Accompt in Company Debtor to *Ditto* Partner's Account current for his Share in the Money receiv'd; and your Partner's Accompt current Creditor by Partner's Accompt in Company for the ſame Sum. But if this Money had been payable by Bill, at ſingle or double Uſance, *&c.* then the Entry would differ little; only inſtead of making Caſh Debtor to Factor, *&c.* the Accompt of him that accepts the Bill ſhould be made Debtor to Factor at, *&c.* and *per Contra* Creditor.

12. When you have receiv'd Wares from your Factor, in Return for Wares ſold by him for Company Accompt, and pay Charges for Freight, Cuſtom, *&c.* at Receipt thereof make Wares receiv'd Debtor to Factor at —— for Company Accompt, between your Partner and you, your Accompt current, for the Value of the Goods and Charges till on Board, as *per* Advice —— ſo much; and Factor at, for Company Accompt between, *&c.* our Accompt current Creditor by Wares receiv'd for the ſame Sum. Then make Wares receiv'd Debtor to Caſh, for the Sum paid at the Receipt, for Cuſtom, *&c.* and Caſh Creditor by Wares receiv'd for the ſame Sum. Then make Wares receiv'd Debtor to Caſh for the Sum paid at the Receipt for Cuſtom, *&c.* and Caſh Creditor by Wares receiv'd, for the ſame Sum. Then to place the Accompt between your Partner and you, make your Partner's Accompt, in Company, Debtor to his Accompt current for his Share, as *per Envoice* of the Return; deducting his Share of the Money, you pay, at the Receipt; and your Partner's Accompt current Creditor, by his Accompt, by you in Company, for the ſame Sum.

13. When you receive Advice that your Factor has ſhipp'd off and conſign'd Wares to your Factor in another Country, for Company Accompt; you are to make Voyage to —— (conſign'd to your Factor, for Company Account between your Partner and you) Debtor to Factor at —— that ſhipp'd the Goods; your Accompt current for their Value, and Charges, as *per* Advice of your Factor; and your Factor that ſhipp'd the Goods at —— your Accompt current Creditor, by Voyage to the Place your Factor reſides at, conſign'd to your Factor in Company, between your Partner and you, for the ſame Sum. Then make your Partner's Accompt current Debtor to his Accompt in Company, for his Share of the Value and Charges; and your Partner's Accompt in Company Creditor, by his Accompt current for the ſame Sum.

14. When Wares are return'd by your Factor to your other Factor in another Country, for Wares ſold in Company, Accompt by your ſaid Factor; you muſt make Voyage, to ſuch a Place, conſign'd to your Factor, Debtor to your Factor at —— for Accompt of Company, between your Partner and you, your Accompt current for the Value of the Goods ſhipp'd; and your Factor at —— for Accompt of Company, between your Partner and you, your Accompt current Creditor by Voyage to ſuch a Place, conſign'd to your Factor, for the ſaid Value and Charges. Then make your Partner's Accompt in Company Debtor to his Accompt current for his Proportion, as *per* Advice receiv'd of the Accompt; his Accompt current Creditor, by his Accompt in Company for the ſame.

14. When your Partner draws a Bill upon you payable at Sight, you are to make Partner, by Name, his Accompt current Debtor to Caſh for the Content of the Bill paid; and Caſh Creditor by your Partner's Account current, for the ſame Sum.

15. When you cloſe an Accompt in Company, you are to take Care to make Wares, *&c.* in Company between your Partner, (naming his Share of the Stock) and ſo much you, Debtor to ſundry Accompts, for cloſing the Accompts, *&c.* to Profit and Loſs, for my Share of the Gain by Trading. To *Ditto*, for my Proviſion, or Employment, at ſo much *per Cent.* as by Agreement. And Profit and Loſs Creditor, by the Sum your Proviſion, and Share of the Gain amounts to. Then Wares, *&c.* in Company, as before, Debtor to my Partner's Accompt in Company, for his Share of the Gain, and, *&c.* his Accompt in Company Creditor, by Wares in Company for the ſame Sum.

Company Accompts are generally eſteem'd very difficult; but if a Perſon underſtands proper Accompts, and Factorage, he will find this very eaſy, there being little Difference more than this: 1. In the Title of an Accompt in Company, mentioning your Partner's Share of the Stock, and yours. After any Thing is bought, ſold, ſhipp'd off, receiv'd, *&c.* and book'd, as in a proper, or Factorage Accompt, (having Regard to the Title of Company Accompt, as aforeſaid) you muſt take Care to make your Partner, or Partner's Accompt current Debtor to, or Creditor by his Accompt in Company, for what you lay out, or receive for your Partner; in which the foregoing Inſtructions will be your Guide.

Having thus far proceeded in *Book-keeping*, it remains to ſhew how to cloſe an Accompt, and ballance our *Books*.

To cloſe an Account, is to make an End, or ſhut up an Accompt, when you intend to add no more thereto; and is done by ballancing, and drawing a Line, *&c.*

All Accounts are clos'd either with Profit and Loſs, or with Ballance, or with Profit and Loſs and Ballance, or with Stock.

All Accounts of Goods or Wares, where all that was bought is ſold, are clos'd with Profit and Loſs; which, if you gain thereby, is enter'd on the Debtor

Side of the Accompt, and on the Creditor if you lose; of which the Account of *Norwich* Wares, *Fol.* 1. is an Example.

All Accompts of Men are clos'd, with Ballance, on the Debtor Side, if you owe to them; or on the Creditor Side, if they were indebted to you.

All Accompts of Wares, where all that are bought are not sold, are clos'd with Profit, and Loss, and Ballance, *i. e.* with Profit and Loss on the Debtor Side, for the Sum gain'd by what is sold; and with Ballance on the Creditor Side, for what, the Goods remaining unsold cost; as in the Accompts of Drugs and Raw Silk.

No Accompts are clos'd with Stock, but with Profit, and Loss, and Ballance.

These Rules carefully observ'd, it will not be difficult to Ballance, either a single Account, or your whole *Ledger*, in order to know how much Cash, Wares, and Debts you have; what Debts you owe, and what you have gain'd by trading since your last general Ballance.

To Ballance any single Accompt, sum up the Debtor and Creditor Sides, and put their Total on a Piece of waste Paper, where take their Difference, which is the Ballance, and must be enter'd on the Debtor or Creditor Side, as is taught in closing an Account; which done, the Sum of the Debtor and Creditor Side shall be equal. But in an Account of Wares, the said Difference is the Profit or Loss, and must be enter'd on that Side whose Sum is least, to make the Sums of Debtor and Creditor Sides equal. And to Ballance your *Ledger*, for the End above-mention'd, take a Sheet of Paper, and on one Side write *Ballance Debtor*; and on the other Side write *per Contra Creditor*, as the Sheet lies extended before you.

To Ballance all your particular Accompts, you must begin with Cash, (except Stock, and Profit, and Loss) which being done throughout your *Ledger*, begin again, at the Account of the Cash, and where an Accompt is clos'd with Ballance, enter the same on the contrary Side of the Account of Ballance in your Paper, as in the Account of Cash above-mention'd, Cash is Creditor by Ballance 2185*l.* 11*s.* 7*d.* therefore Ballance, on your Paper, must be made Debtor to Cash 2185*l.* 11*s.* 7*d.*

Likewise, where an Account is clos'd with Profit and Loss, enter the Ballance Sum on the contrary Side of the Account of Profit and Loss; as in the Account of *Norwich* Wares, which is clos'd Debtor to Profit and Loss 26*l.* 12*s.* Therefore Profit and Loss must be Creditor by *Norwich* Wares. And where you meet with an Accompt clos'd both with Profit and Loss, and Ballance, as is that of Voyage to *Aleppo*, consign'd to *P. Trueman*, because Ballance is on Creditor Side, make Ballance on your Paper Debtor to Voyage to *Aleppo*, &c. 150*l.* 12*s.* 6*d.* and because the said Account of Voyage, *&c.* is Debtor to Profit and Loss, make the Account of Profit and Loss Creditor, for the like Sum of 150*l.* 12*s.* 6*d.* And thus having guided you through the several Cases that may happen, proceed with the rest of the Accounts to the End of your *Ledger*, leaving Profit and Loss unclos'd till you have clos'd and ballanc'd the rest of the Accounts, except Stock. Then close the Account of Profit and Loss, with *Debtor* to, or *Creditor* by Stock, and carry the Foot to the contrary Side of the Account of Stock, as in the Example of the foregoing Account of Profit and Loss clos'd with Debtor to Stock 896*l.* 10*s.* 1*d.* Stock must, therefore, be made Creditor, by Profit and Loss, 896*l.* 10*s.* 1*d.*

With the Difference of Debtor and Creditor Side of Ballance, *i. e.* with *Debtor* to, or *Creditor* by Stock, close the Account of Ballance, and carry the Foot to the Account of Stock, as in the foregoing Account of Ballance, it is so clos'd; *Creditor* by Stock 3546*l.* 0*s.* 0*d.* Therefore Stock must be *Debtor* to Ballance 3546*l.* 0*s.* 0*d.* Then sum up the Debtor and Creditor Sides of the Account of Stock, and if they ballance, or are alike, your *Books* have been kept right, otherwise you have committed some Error.

Take this for a general Rule for Ballance of Accounts, that your present Stock, and what you ow'd when you began the Account now ballanc'd, will be always equal to your Stock, when you began your Accounts, and what you have gain'd since, to the Day the general Ballance is made. The Reason of this is plain; for your former Stock, and what you have gain'd since, must be your present Stock; as in the Example foregoing of Stock, your former neat Stock (Debts deducted) is 2649*l.* 10*s.* 0*d.* and you have gain'd since, as appears by the Account of Profit and Loss, 896*l.* 10*s.* 1*d.* the Sum of which is 3546*l.* 0*s.* 1*d.* = your present Stock; but if you add, as you must, your Gross Stock, when you began Trade, to what you have gain'd since; the same will, consequently, be just so much more than your present neat Stock, as was the Sum you ow'd when you began Trade; which if you therefore add to your present Stock, the Sum must be equal to your former Gross Stock, and the Sum gain'd; which is evident in the Example.

For if 2649*l.* 10*s.* — 510*l.* + 896*l.* 10*s.* 1*d.* be = 3546*l.* 0*s.* 1*d.*:

It follows,

That 3159*l.* 10*s.* + 896*l.* 10*s.* 1*d.* is = 3546*l.* 0*s.* 1*d.* + 510*l.*

Note, That (—) is less, (+) more, and (=) equal to.

At present, the most considerable Shop-keepers, who commonly deal in a few different Species of *Goods*, as Drapers, Mercers, *&c.* usually keep a *Ledger* for Persons and Wares distinct, without any formal Connection or Reference of the Accompts in their several Articles; whereby there can no regular Ballance be made. In the Accompts of Persons they use the Formality of a *Debtor* and *Creditor* Style, which is mere Shew, without the real Value of a regular Accompt; there being no opposite corresponding *Debtors* and *Creditors* to be found; for their *Ledger* of Wares, as they call it, contains nothing of this, and is but an imperfect Contrivance, which they satisfy themselves with, to know how much remains; but the worst is, that in allotting Spaces for the Accompt of Wares, they frequently allow no more than they suppose may serve for the Retail of the Quantity first enter'd on that Space for a new Parcel; which, in a quick Trade, is not only troublesome, but confus'd, if there be any of the old Parcels remaining; unless they carry it to the new Accompt.

For petty Traders, who deal in some Hundreds of trifling Wares, and make Sale to the Value of a Farthing, or Halfpenny, they cannot pretend to keep orderly Accounts; the best they can do is, to be careful that Servants do not wrong them; for they have no Accounts of *Goods*; and if they are ask'd what of any Kind remains with them, they must go look, if their Memory fail. These can only have a *Cash Account*, which they are to charge, once a Week, with the Money receiv'd, and discharge for what they give out; it is not convenient that they should touch the *Cash Book*, or *Till*, oftener than once a Week, when it is compleated; but if they do, they must keep a separate Accompt of what they take out, to know what was receiv'd: Besides which, they should have a kind of *Ledger* for the Persons with whom they deal upon Credit; in which they give every *Debtor* or *Creditor* an Accompt, with a Debt and Credit both on one Side, either with a double *Money-Column*, or constant Deductions, as the Debts and Credit succeed one another. They may also, for the Sake of those, have *Memorandums*, or *Day-Books*, wherein all Things of this Nature are writ down, and then carried into the other.

For Artificers, Handicraftsmen, and the like, they may keep Accompt of the Expences of Living; but it will also be necessary to make a distinct Accompt of the

the Charges and Profit of their Buſineſs, which may eaſily be done, by an exact Accompt of all they pay or owe for the Materials and Inſtruments of their Work, with Servants Wages, and Taxes upon their Trade; and of all they receive; of what is due for their Work. They may conveniently keep Accompt for the Materials of their Work, to ſatisfy them of the Diſpoſal thereof, and ſerve as a Check on Servants, who have Acceſs to thoſe Things, and they muſt keep Accompts for the Perſons they deal with, both in buying and ſelling.

For Gentlemen of landed Eſtate, the Books neceſſary to be kept are, 1. A great *Waſte Book*, containing a plain Narrative of all Things, as they occur, as Receipts and Payments; every Thing given and received; and, in ſhort, whatever is done relating to any Thing, or Perſon they are concerned with: Out of which is to be made up, 2. A *Caſh Book*, containing in a plain narrative Stile, upon the Debtor-Side, all Receipts of Money; and upon the Creditor-Side all Payments; and though there be ſeveral Articles received or paid together, belonging to the ſame Account, which are entered particularly in the Waſte, yet they may be ſet down here, in a Total Sum; for Example, there is paid 26 *l.* for divers Pieces of Houſhold Furniture, all particularly mentioned in the *Waſte-Book*, yet in the *Caſh Book* there needs no more than to ſay paid for Houſhold Furniture, *&c.* 3. A *Book of Accompts with Tenants*, where, in diſtinct Places, every one's Charge and Diſcharge may be fairly written, without any great Formality of Stile, and if it have a Shew of Debtor and Creditor-Side, it will be the more diſtinct. 4. A *Book of Petty Accompts with Servants and Workmen*, &c. 5. A *Book of real Accompts*; containing an Accompt of Cattle, Corn, and other Stock or Furniture, to know at all Times what you have, and how it is diſpoſed of. If a Gentleman advances no nearer to the artificial Part of Accompting, he muſt keep an Accompt with every Perſon, with whom he has Dealings; which may be done in the ſame Book with his Tenant's Accompts, only allotting diſtinct Parts for them; the laſt will take no great Room compared with the other. Theſe Books of Accompts muſt have Indexes.

For a Perſon in a ſingle State, who has no Buſineſs but the receiving at certain Times in a Year, a Sum of Money, which he lays out again for his private and perſonal Expences, a Pocket-Book is ſufficient.

For one in a married State, whoſe Fortune conſiſts alſo of Money, as he has greater Variety of Expences, he muſt be careful to keep an exact Accompt of what Caſh he receives and pays; and to make this Accompt more diſtinct and orderly, it will be beſt to keep the Particulars of the Payments in a ſeparate Book, and to bring them into a *Caſh Book*, once a Week, in Totals, digeſted under ſuch Denominations as he thinks fit, as *Bread*, *Beer*, *Fleſh*, *Coals*, *Candles*, &c. Things thus brought into the Caſh Accompt, may be again drawn into an Abſtract, ſhewing the Total of each Kind of Expences for every Month, by dividing a Page into twelve Columns, with the Names of the twelve Months; and then in ſo many Articles, on the Margin, ſetting the Names of the ſeveral Heads of Expences, and againſt each, under the reſpective Month, the Sum of that Kind of Expences, in that Month; then will the Sum of the Money in the Columns, under each Month, be the total Expence of that Month, and the Aggregate of thoſe Sums the Year's Expences.

For Factors, or Stewards on Land-Eſtates, a general *Waſte-Book* is neceſſary to contain all Matters tranſacted, relating to their Maſter's Concerns, under their Management; out of which let them make a *Caſh-Book*, in the Manner above directed; alſo a Book of real Accompts, that they may know what real Effects, beſides Money, they have the Charge of, and how it is diſpoſed of; particularly the Corn Rents, which have been delivered by the Tenants, and put in the Granaries under their Charge, to be diſpoſed, and given out according to Order.

BOOKSELLER.

BOOKSELLER, is a Perſon, whoſe chief Employment is to vend and expoſe to Sale Books of all Kind of Literature, and Learning, whether he prints them himſelf, or has them printed by others.

The Profeſſion is extremely honourable of itſelf, and in ſeveral Parts of *Europe* is practiſed but by Men of Judgment, and of a liberal Education; eſpecially in *France*, where, even at this preſent Time, that Education, and Learning, meet with as little Encouragement in that Country, formerly the Theatre of Learning, and of the learned, as any where elſe; ſeveral *Bookſellers* are yet Maſters of Arts, and can be choſe Rectors of the Univerſity; who formerly had the ſole Power of creating and appointing *Bookſellers*; to which they were to give Security for their good Behaviour, and produce Atteſtations of their Capacity for the Diſcharge of their Office: The Univerſity alſo depoſed and expelled them at Diſcretion. They were to appear at all the Aſſemblies of the Univerſity, when ſummoned; and aſſiſt at the publick Proceſſions thereof. They were obliged to lend their Books to be read, or even copied by ſuch as were diſpoſed to borrow, on certain Conditions preſcribed by the Univerſity. Every *Bookſeller* was obliged to have a Catalogue of all his Books, hung up in the Shop, with the Prices, as rated by the Univerſity: No *Bookſeller* who had not taken the Oath to the Univerſity, might ſell a Book above ten Sols Value.

Theſe were the Regulations of the Library in *France*, before the Invention of Printing, which even continued in Force (after that Noble Art was found) 'till the End of the fifteenth Century; when the King of *France* began to take Cognizance of them. *Lewis* XI. thought fit to preſcribe ſome new Regulations, in 1467. Under *Francis* I. the *Bookſellers* were brought wholly under the Royal Authority; and received State from the King: Thereby they were formed into a Society, or Company; none being allowed to open Shop, for the publick Sale of Books, without being a Member of that Company.

In Proceſs of Time, to ſecure the Propriety of his Copy to the Author, or to the *Bookſeller* he had engaged with, for having it printed, it was ordered that none ſhould be printed, without the King's Privilege, under the Penalty of Confiſcation of the *Examplairs*, as they call it, beſides a Pecuniary Penalty, and of having their Shop ſhut up, for a certain Time, according to the Nature of the Offence. All other *Bookſellers*, except him who has purchaſed the Copy, or is to have it printed for the Author, with the Royal Privilege, are forbid to reprint the ſaid Copy, or have it reprinted beyond the Seas, in order to have it afterwards diſtributed, throughout the Kingdom, under the ſame Penalties; provided the ſaid Privilege be regiſtered by the *Syndic* of the Company, in their Regiſter; and the *Examplairs*, mentioned in the Privileges, delivered into the King's Library, and into that of the Chancellor of *France*. The ſaid Privilege ſeldom continues longer than ten Years, which commonly begins when the firſt Edition is finiſhed printing.

Another Regulation which the *French Bookſellers* are ſubjected to, is, that no Books of Divinity are to be publiſhed

publiſhed before it has been reviſed, and approved by the College of *Sorbonne*; nor no other Books, without the Approbation, in Writing, commonly printed at the Beginning of the Book, of the Lord Chancellor, or his Deputy, for *Paris*; or of the Attorney-General, or his *Subſtitute*, as they call it, or Deputy, in the Provinces. Through thoſe means they pretend to prevent the Kingdom from being corrupted by Hereſy or Schiſm; and their Morals from being debauched by vicious and obſcene Books.

In Fact, the Shops of *French Bookſellers* are ſeldom found ſtuffed with thoſe vicious Books, whoſe ſole Frontiſpiece would provoke the Scorn and Indignation, not of a Chriſtian only, but even of an honeſt *Pagan*. If thoſe Sort of Books are ſometimes found in *France*, they are always ſold, *Sous le Manteau*, as contraband Goods. And if the Retailers of ſuch pernicious Commodities are diſcovered, they never eſcape Puniſhment, which is the Impriſonment of the Vender, a Confiſcation of his Books, commonly burned by the common Executioner, and a Fine. No Doubt, but if Obſcenity was as much tolerated there, as it is here, it would be as much encouraged by Youth, and old Fornicators; and *French Bookſellers* would be as eager as ours to purchaſe ſuch Copies, preferable to thoſe written for the Encouragement of Piety, Virtue, and Morality.

It would be a capital Crime there, for a *Bookſeller*, to publiſh or vend any Book, tending towards the entire Ruin of Chriſtianity, by denying, or turning into Ridicule, the greateſt and leſs controverted Myſteries thereof, as the Trinity, the Miracles of Chriſt, *&c.* It is true, that *France* is not a Country of Liberty like ours, and that ſome think it beſt to go free into Hell, than to be forced againſt our natural Inclinations into Heaven; the greateſt Part of our Clergy are themſelves ſo jealous of thoſe Privileges we enjoy as a free People, that their Conduct would, in their Opinion, ſmell too much of Popery and arbitrary Power, if they were to exert themſelves on thoſe Occaſions, by having *Bookſellers*, who ſhould vend any Books capable to debauch our Morals ſeverely puniſhed, and all ſuch Books committed to the Flames. But Indolency in this Caſe, is alſo, I ſuppoſe, a Mark of Liberty.

French Bookſellers, are alſo as cautious in publiſhing Satyrs againſt the Governments, as againſt Religion or Morality, though thoſe Sort of Books are as common there, as they are here; but they are always publiſhed at *Cologne*, by *Pierre Marteau*, or *Jean Le Blanc*, though, at the ſame Time, they came no farther than from the *Rue St. Jaques*, unleſs the Author be pleaſed to diſcover himſelf, and then he is laugh'd at by the Government, or ſent for a few Months to the *Baſtille*, where he is kept at the King's Expence, coming out of it as rich, or as poor as he went in. For the Puniſhment in *France* for Libels, as we call them here, never extend farther, otherwiſe the Nation would appear more fond of ſuch Satyrs, whoſe Reign is always very ſhort, becauſe ſeldom minded by the Government. The greateſt Puniſhment of a *Bookſeller* for ſuch Offence, is a Pecuniary Fine, and having his Shop ſhut up for a few Months. Therefore they never diſcover their Authors, eſpecially when they conſider, that ſuch Diſcovery would not render them leſs guilty; for the *French* Miniſtry make a Difference between the Author and the Printer, or *Bookſeller*. The Printer or *Bookſeller* is not puniſhed there for the Author, nor the Author for the *Bookſeller*. The Author is puniſhed for writing the Book, and the *Bookſellers* for having it printed, and publiſhing it. The *French* Miniſters are very well aſſured, that there would be no Satyr printed or publiſhed, if a Printer would not print it, or a *Bookſeller* was to refuſe to publiſh it; ſince an Author cannot force them to do either. Therefore the moſt guilty muſt be the Printer or *Bookſeller*.

Here our Conduct is quite different, for a Printer may print, and a *Bookſeller* may publiſh what Books he pleaſes, provided he knows his Author, to deliver him up to ſereen himſelf againſt all Sort of Puniſhment, which in my Opinion, is not an extraordinary good Politick in a Government, and which can by no means anſwer the End propoſed, which is the entire Suppreſſion of thoſe Satyrs. Since it almoſt always happens, that the Authors of thoſe Satyrs are unfortunate Gentlemen, without Fortune or Intereſt, and buried perhaps in the Duſt of a Garret, who having nothing to depend upon for their Subſiſtence, but their Education, are forced to have Recourſe to it, when preſſed too cloſe, by the moſt formidable of our Enemies, Hunger; and as they have had perhaps the Misfortune of being born in an Age, which has no other Taſte but for Satyrs, eſpecially againſt ſuperior Powers, and that they are told by *Bookſellers* that nothing elſe will pleaſe, or to uſe their own Terms, nothing elſe will ſell, and they conſequently will buy or encourage nothing elſe; the *poor Author* ſets himſelf down, and writes, in that pleaſing Style, the better, perhaps, becauſe ſeaſon'd with thoſe ſharp Reflections occaſion'd by the Calamities attending his unhappy Condition. The *Work* done, he carries it to the *Bookſeller*, who, conſcious of his Miſery, purchaſes it at a very *low* Price, ſcarce ſufficient to appeaſe the *loudeſt Clamours* of his domeſtick Enemy. The *Bookſeller* has, perhaps, no ſooner publiſh'd his *Work*, but he is ſeiz'd, by a Couple of Meſſengers, from whoſe Hands he is ſoon deliver'd, by the Diſcovery of the *unhappy Author*, who is ſeiz'd, in his Turn, and perhaps confin'd in a frightful *Dungeon*, no otherwiſe different from *Hell* but in the Duration of the Torments.

What Advantage can accrue to a Government from the Confinement of ſuch a Wretch? None. For the *Bookſeller*, being at Liberty, continues to publiſh his *Book*, which, by the Confinement of the *Author*, proves rather more profitable to him than before; and thereby turns the Chains of his *Author* into *Gold*, and feeds deliciouſly, while the *poor Satyriſt* is denied even the Neceſſaries of Life, and deſerted by the *whole World*, who avoid him as if he was affected with ſome *contagious Diſtemper*. Or if all the *printed Copies* are ſeiz'd, the ſame *Bookſeller* will ſoon find ſome other *neceſſitous Fool*, whom, though he ſhould be wiſer by the late *Misfortune* of his *Brother*, he engages to write on the ſame Subject, and in the ſame Style; and whom he finds the Secret ſoon to ſend to keep Company to the other Satyriſt; and thus *in infinitum*: While, if a *Government* was to puniſh the *Bookſeller*, not by a *corporal Puniſhment*, but by a *pecuniary one*, it would ſoon find the Secret to ſuppreſs all thoſe Satyrs. For as *Bookſellers* print nothing but for the Sake of Lucre, when they ſhould find that their Gain would not anſwer the Charges of a *Proſecution*, they would ſoon deſiſt printing any Thing which could offend; and then what bad Effect could produce a Satyr, which the *Author* would be forced to keep in his Garret, or to ſell to *Cheeſemongers?*

This is not the ſole unfair Dealing of our *Bookſellers*, with reſpect to our *Author*; for they commonly treat him with the greateſt Scorn and Haughtineſs, eſpecially if he be forced to ſet his *Performances* to *Auction*. The firſt Salute he muſt expect from them is, to hear his *Work* under-valued, or even deſpis'd, often by a Perſon, who, far from being a competent Judge, can ſcarcely make a Difference between a plain Sheet of Paper, and a written one. Or if the *Bookſeller* is humble enough to acknowledge his Want of Capacity, the *Author* muſt wait, before he can have a deciſive Anſwer, till his *Work* has undergone the *Inſpection* of *another Perſon*, on whoſe Judgment the *Bookſeller* depends, though often as great a *Noodle* as himſelf; and then if the *ignorant Cenſor* pronounces in Favour of a *Work*, which, but *too often*, he does not better underſtand than the *Alcoran*, the *poor Author* may expect a favourable Anſwer; if not, his *Copy won't do*, and he muſt go to hawk it ſomewhere elſe. If he chance to find a Purchaſer, at laſt, and the *Book* anſwers beyond Expectation; then the firſt it was *offer'd to*, enrag'd with himſelf, for having loſt the *Opportunity* of getting that *Money*, (for Avarice,

and an extravagant Desire of Gain, seem to be inseparable from that Trade) discharges his Rage upon the *poor Author*; as if, on the contrary, he should not be oblig'd to him for having offer'd him the Preference.

I do not mention here another great Difficulty, or Disadvantage, *Authors* labour under, which is, of being often cheated of their *Copies*, which the *Bookseller* takes Care to have transcrib'd, before he returns it to the *Proprietor*; which is a *Robbery* worse than those committed on the Highway; since it is not reasonable to suppose that Gentlemen, almost all born of very *good Families*, and of an *Education* above the *common People*, would demean themselves so low, as to cringe to Persons often infinitely beneath them, if not *forced* to it by an indispensible Necessity; and to take Advantage of that Necessity, to *rob* them of their *Property*, must be the greatest Piece of Knavery a Man can be guilty of.

Booksellers will answer, perhaps, that they *force no Body* to write; and therefore those who write must subject themselves to all those *Inconveniencies*. 'Tis true, that they can *force no Body* to write, though they would often *force Authors* to write for little or nothing; but if *no Body* was to write, what would become of them? How could some of them get, perhaps, twenty, thirty, or fifty *thousand Pounds*; who, when they began, first, *Bookselling*, were not worth ten, if *no Body* was to write? Are they not indebted to *Authors* for those immense *Fortunes?* And should they not, in Gratitude, use *Authors* civilly, if they will do nothing else?

To remedy these *Inconveniencies*, the Legislature should take under its *Consideration* the unhappy Fate of *Authors*, and that some of them, being as well *born*, and as well *educated*, as those who have the Honour to be related to the best Families of the *Kingdom*; and having no other Disadvantages than those of *Fortune*, which does bestow her Favours on them, but with *Parcimony*; deserve the *Protection* of the *Nation*, since they do as much *Honour* to it, by their Capacity and Genius, as those who represent her in the Senate do her Service. All kind of Obscenity in Writing should be condemn'd as destructive to the Commonwealth, thereby Vice and Debauchery being depriv'd of its *common Food*, (if I may use that Expression) it would be, at last, entirely suppress'd, and *Booksellers* finding no *Encouragement*, in the *Publication* of their *obscene Books*, could not have any Pretext to condemn *poor Authors* to that scandalous Drudgery; and those who should chance to have no other Talent, would be silenced, and *forced to follow some other Employment*, to get a *more honest Livelihood*. *Booksellers* should not be *obliged* to buy *Copies*, which they should not like, and which could not defray all the Charges of Printing, with a reasonable Gain; but they should pay for such as they like, and which they think would answer all those Purposes, what they are worth; otherwise punish'd as *common Oppressors*; and as *common Thieves*, if they were to steal the *Copy*, or when they have it printed, on the *Author's Account*, to have a certain Number of *Books* printed for themselves, which they sell, while they keep those of the *Author unsold*, in their *Shops*; which is but *too often* their *Practice*.

Among all the Vices of our *Booksellers*, (a few excepted) *Monopoly* is their *Favourite*; for though we can judge, from several Instances, that there is no great *Cordiality*, or *Friendship* subsisting between them, they nevertheless all reunite in one, (especially those among them, who by their Wealth have acquir'd the greater *Reputation*) to *oppress* those of their Brethren they have some Pique against, which always proceeds from Self-interest; it seems, because they live in *Splendor* and *Opulence*, as if they were determin'd others should not live at all. I cannot blame them for *opposing* those, who, contrary to all Laws and Equity, *rob* them of their *Property*, on Purpose to under-sell it, and thereby frustrate them of the *Profit* they could reasonably expect from it: But it is equally unjust in them, to attempt to *engross* the *whole Trade* to themselves. What! because they are Masters of a *Copy*, which has prov'd beneficial to them, must others be depriv'd of the same Advantages which they suppose they could make of another such *Copy?* Must no *Author* write, but those who write for them? Or is none capable to write, but those who write for them? Or does the whole Merit of a *Work* consist in their publishing it? Are there none *good* but those which are publish'd by them? Must every Subject be deserted, which has been once treated of for them? Must the Version of the Scripture by St. *Jerome* be despis'd because that of the *Septuagint* was the first, and much esteem'd? Have the Writings of *Tertullian*, *Origen*, and St. *Cyprian*, eclips'd the Lustre of those of St. *Augustine?* Or those of St. *Augustine* prov'd disadvantagious, or detrimental to those of *Tertullian*, *Origen*, St. *Cyprian*, &c. Must any future Poets forbear writing, because Mr. *Pope* has wrote with a general Applause? Why has Mr. *Chambers* compil'd a *Dictionary of Arts and Sciences*, since *Corneille* had done it before him? What, because he has pyrated *Corneille*, and has made a kind of *Dedalus*, which has neither Beginning nor End, with a *monstrous Confusion* of unnecessary and inaccurate References, which puzzle the most judicious Reader; and because our eminent *Booksellers* (as they are pleas'd to call themselves) have publish'd that *Work*, must *no Body* be permitted to write something better, and dispose it in a more instructive and clearer Order?

Most of our *Booksellers* labour under a very great Disadvantage, which is, that very few of them have a liberal Education; therefore, though their *Profession* is one of the most genteel and honourable, and very well becoming a Gentleman; they, nevertheless, have no other Advantage above the meanest Trader, than that of dealing in *Books*, while others deal, perhaps, in *old Books*, *Oysters*, *Apples*, &c. which makes me compare them to a blind Man, introduc'd into a Place adorn'd with some of the inimitable Pieces of *Titian*, *Michael Angelo*, *Raphael*, *Rubens*, *Le Brun*, *Coypel*, *Holdben*, *Vandike*, *Kneller*, &c. For though he be environ'd with some of the most beautiful Pieces of Painting, he is nevertheless an utter Stranger to it, nor can he judge of their Elegance and Beauty. Likewise, our *Booksellers* are, perhaps, every Day amidst the best *Authors* every Age has produc'd, and are, nevertheless, as great Strangers to them, as if they were carried all on a sudden to the Court of *Prester John*, though some of them are very much infatuated with a pretended Merit, which 'tis impossible any Body else should discover but themselves.

I wish our *Booksellers* would follow the Example of those of *Paris*, where there is not one who has not studied, at least, as far as Rhetorick, and consequently understand the *Greek* and *Latin* Tongues; and therefore can read most of their *Authors*, and, if they have any Genius, can likewise understand them: But as the Reading is the Key to it, how can ours pretend to be Judges of a *Work*, when they cannot so much as read it? They trust for it to the Judgment of another; but how can they know if that other judges right, since they know nothing of his Capacity, but by Supposition, or Infatuation? For often, as I have already observ'd, those pretended Judges have themselves so little Discernment, that they cannot be competent Judges; and those who have the least Glimpse of it, are so infatuated with it, that they give their Opinion by Partiality, and often without examining the *Work*. For most of the *Authors*, like the meanest Mechanick, (which is a Scandal to their Profession) very seldom like any Thing else but what comes from their own Pens; and the worst is, the most illiterate are always the readiest to condemn the *Works* of others, and to think themselves a Phœnix of the Age. And who suffers by such ridiculous Infatuation, but the *Booksellers* themselves, who could avoid those great Inconveniencies, so prejudicial to them, and to the learned World, if they would render themselves capable to be Judges of a *Copy*, or of the Capacity of their Judges. What! because an *Author* has wrote once,

once, by pure Chance, a few Sheets, which have answer'd the Expectation of a *Bookſeller*; muſt he be accounted a competent Judge of all Sorts of *Works?* Muſt a Man who has wrote, perhaps, a bold Satyr, or rather a Piece full of Invectives and Impudence, which has ſuited the deprav'd Taſte of the Times he chanc'd to write it in, be ſuppos'd capable to judge, *en dernier reſſort*, of another Piece of a quite different Taſte? Or can it be expected that he'll have any Taſte for ſuch a Piece? But he writes in the Taſte of the Age, *i. e.* becauſe *Bookſellers* entertain the Age in that Taſte; but let them preſent our Underſtanding with a wholſome Food, and they'll find that our Appetite is not ſo deprav'd as they imagine.

What Judgment will our Poſterity form of the *Bookſellers*, when they find that in their Times they have publiſh'd nothing but Obſcenity and Ribaldry? Muſt they not imagine that their Minds were very much vitiated, or that our Age produc'd nothing elſe but Profligates and Blockheads, utter Strangers to Morality, and true Learning?

'Tis true, that the *Works* of thoſe *Authors* are bought very cheap, conſidering what *Bookſellers* gain by it; but thoſe ſort of *Works* have but what *Bookſellers* themſelves call a Run, and will never bear reading twice; they are like thoſe *Spaniſh olla Podridas*, or *Pots Pouris*, which we have a Fancy to taſte once, but which we ſhould be ſorry to ſee every Day ſerv'd at our Tables, as a common Food; while, on the contrary, thoſe written for our Edification, or Inſtruction, have always their Merit, and are always in Requeſt: And if the *Bookſeller* is longer kept out of his Money, he might, however, conſider it as an Eſtate he has purchaſed, not for himſelf only, but likewiſe for his Poſterity, and which is to bring him ſeveral Times the Intereſt and Principal, without the Fund being ever exhauſted. A deprav'd Taſte is never univerſal, and never reaches the moſt ſenſible Part of a Nation, which has always the Majority on its Side; and far from being hereditary, 'tis ſeldom of a long Duration: Which Conſideration muſt be a very great Inducement to a *Bookſeller* to buy valuable *Copies*.

But thoſe valuable *Copies* are ſo ſcarce, why? Becauſe *Authors* meet with no Encouragement from *Bookſellers*. For, if a *Copy* is valued above twenty or thirty Guineas, 'tis too dear, and a *Bookſeller* does not care to run the Riſque of ſuch a Purchaſe, unleſs the *Author* would have it printed on his own Account. Yes, but who will anſwer to that *Author* for the Probity of the *Bookſeller?* For if the *Author* is obliged to truſt entirely to it, and has not Intereſt enough to diſpoſe of a certain Number of his *Books* ſufficient to defray the Charges, he muſt be at all the Charges for the printing of it, which are always exorbitant enough (for though *Bookſellers* do not pretend to be Apothecaries, they nevertheleſs underſtand how to make an Apothecary's Bill) how can he be certain that the *Bookſeller*, according to Cuſtom, will not, like an able Arithmetician, *ſet down* o, *and retain all.* Therefore is it not better for him to ſtand idle, than to be expos'd to loſe both his Labour and Money? An Inſtance or two will convince the Publick that ſuch a Thing is very poſſible.

An Acquaintance of mine had tranſlated into *Engliſh* a *French* Book, intituled, *The Doctrine of Morality*, written by *Gumberville*, for the Inſtruction of *Lewis* XIV. King of *France*, while yet an Infant: This Book was embelliſh'd with above a hundred Copper Plates, repreſenting the Gallery of *Zeno*, and engrav'd by *Drevet*, the young King's Engraver, and which the Tranſlator had purchas'd from *Drevet's* Executors, for the Sum of fifty Guineas. He had engag'd here for the printing of his Book with a Set of *Bookſellers*, call'd the *Congre*, which really was compos'd, as I believe, of ſome of the moſt honeſt of the whole Trade, who perform'd their Articles, as far as the printing and publiſhing the Number of Books agreed upon by both Parties, which, before it was printed, would, in their Opinion, anſwer both their Expectations, and that of the Tranſlator: But when he came to call them to an Account, their Tune was chang'd, they had moſt of the Books left in their Shops; and whatever the Tranſlator could do, he did not receive from them Money enough to pay for half the Plates; till quite tir'd, at laſt, of their frivolous Evaſions, he offer'd to ſell them his Right to the Book, Plates and all, which was what they wanted, though they affected a very great Indifference in it, till they had brought the poor Tranſlator to their ſcandalous Terms, which were, that he ſhould be contented, for his Property, the Plates, and Books left unſold, with fifteen Guineas; the beſt Terms he could ever be capable to obtain from them; unleſs he had rather chuſe to have nothing at all. This is not a Romance, for I was preſent at all theſe Tranſactions.

The *French Bookſellers* are very ſeldom guilty of ſuch Miſtakes, not to uſe a worſe Expreſſion; they ſupport the Honour of their Profeſſion, and their Credit, by their fair Dealings, which encourages *Authors* to write for them; neither could they, if they would, for the Regulations of the Library keep them in Awe, and an *Author* can always have his Recourſe to the Company, from whom he may expect an ample Satisfaction. He can depend on the true Performance of the Articles he enters into with them, without the leaſt Danger of being cheated of his Property. I mean right *Bookſellers*, for I have too great a Value for the Profeſſion to diſhonour it ſo far, as to rank among them thoſe Publiſhers, and Venders of *Rogatons*, or ſcandalous Sheets, every Nation is peſter'd with, and who are a Scandal to the Trade. People who print ſuch Stuff, which would make that Part of the human Body, they commonly ſerve, in the meaneſt Capacity, bluſh, with Shame, if it was ſuſceptible of it; who diſfigure the beſt Performance, with the ſcandalous View of under-ſelling the fair Trader; whoſe Shops are nothing elſe but a Repoſitory of low and infamous Satyrs, Obſcenity, Immorality, Scandal and Impertinence, and a Receptacle of ſtolen Goods. Theſe Retailers commit the ſame Depredations on a good *Author*'s Work, as an unſkilful Painter does on a good Face.

The Privilege which the *Authors* or *Bookſellers* are oblig'd to obtain in *France*, before they can be permitted to publiſh their *Works*, has very much contributed towards extirpating ſuch Vermin in that Kingdom; and all the ſpurious Copies vended there, are commonly printed in *Holland*, where they have uſurp'd a certain Right of counterfeiting every Thing, Money not excepted. That Privilege has alſo procur'd this other Advantage to the *Republick of Letters*, that all Sorts of Books are printed, in *France*, in good Types, or Characters, and on very good Paper; which are two Conditions mention'd in the Privilege. 'Tis true, that, *Cologne* excepted, no Nation had, for a very conſiderable Time, ſo good Types as the *French*; but ſince we have found the Secret to rival them in that, as we do in ſeveral other Things; and ſince we have a *Caſlon*, who ſurpaſſes *Elzevir*, for the Beauty of his Types, 'tis ſurprizing that our *Bookſellers* do not take greater Care to have their Books better printed.

Bookſellers ſhould alſo take a particular Care to have a good Corrector of their own; a Perſon who ſhould not only be entire Maſter of the *Engliſh* Tongue, but have alſo ſome Tincture of the Science, the Book to be publiſhed treats of; to correct the Slips which the Author may have made through Inadvertency, and the Blunders occaſioned by the Ignorance of the Compoſitor, and the Inſufficiency of the Correctors of the Preſs; who, ſometimes, are but poor ignorant Wretches, who ſeldom underſtand any Thing elſe but their Mother-Tongue, and even that but imperfectly, and whom the Printers employ, becauſe the *Bookſellers* allow them little or nothing for it; for *Bookſellers* muſt be conſcious, that Uncorrectneſs is a very great Diſadvantage to the whole Work. I have found no leſs than 500 ſuch Faults in one of the Volumes of *Cyclopædia*, though I have not examined it narrowly, which Mr. *Chambers* could never be guilty of,

of. Nay he is not even correct in the Quotations he has tranſcribed Word for Word from other Authors; for he makes them ſay, what is entirely contrary to the Rules of the Arts they profeſſed. I have this Advantage over him, that my Printer, beſides his being very careful, has a juſt Diſcernment, and very good Notions of Arts and Sciences, therefore I have no need to fear that my Work ſhould be crowded with ſuch unpardonable Blunders.

Jealouſy is a Vice which reigns very much among our *Bookſellers*; for if they find that ſome of their Brethren are in Poſſeſſion of a Copy which ſuits the Taſte of the Nation, or to uſe their own Terms, which ſells well, they'll ſet up, if they can, ſome Rhapſody, under the ſame Title, in Hope, by impoſing on the Publick, to divide the Booty; of which we have had lately an Inſtance in *Pamela*, for when ſome *Bookſellers*, greedy of Gain, as they are all, perceived that *Pamela* had the Vogue, they ſet up a *Pamela* likewiſe, in Oppoſition to the true *Pamela*, and to the Detriment of its Author; ſo that for a conſiderable Time, and even now, the News-Papers are filled with nothing elſe but *Pamela*, *Anti-Pamela*, *Pamela* in a low Life, *Pamela* in a high Life, and I expect every Day *Pamela* in another Life; for really ſhe cannot very well make any other Figure in this; without conſidering that thoſe Sort of Subjects, ſterile of themſelves, when carried beyond a certain Period, muſt be very inſipid, and become tedious. Had *Daniel De Foe* contented himſelf with the firſt Volume of his *Cruſoe*, he had avoided the bitter Cenſure, which has been paſſed upon his Second. What provokes me moſt, is to ſee that Filth and Dirt, which Gentlemen of their Profeſſion throw at each other, on thoſe Occaſions, which muſt be very offenſive to the moſt ſenſible Part of the Nation; though I muſt ſay this in Commendation of the Author of the right *Pamela*, with whom I am not particularly acquainted, that he has behaved with a great deal of Prudence and Moderation; and really he could not have done otherwiſe, conſidering the general Character he bears of an inoffenſive and very honeſt Man.

It has been a Practice, of late, among our *Bookſellers*, to buy Libraries of Perſons deceaſed, and ſell them by Auction, and the better to allure the Publick, they advertiſe thoſe Libraries under a *Latin* Title, *viz. Bibliotheca ſelectiſſima Clariſſimi Viri*, ſuch-a-one, and continue the reſt of the Advertiſement in *Engliſh*, as if thoſe few *Latin* Words, could be a Recommendation to ſuch a Library, or add ſomething to its Value; for it cannot be reaſonably ſuppoſed, that it is done with the Deſign to let the Publick know that ſome of our *Bookſellers* are Maſters, at leaſt, of thoſe few *Latin* Words, and no more, which ſome ill-natur'd Perſons would, perhaps, maliciouſly ſuppoſe, under Pretence, that the whole Advertiſement could be as well in *Engliſh*; unleſs that Scrap of *Latin* ſhould be added to it, to render the whole ridiculous, and hinder Perſons of Senſe from reading it, inſtead of gaining their Attention. But if *Bookſellers* imagine that there is ſome Merit in the *Latin* Tongue, why don't they exert themſelves, and endeavour to render themſelves Maſters of it, or at leaſt underſtand it; for in Fact it is more univerſal, and of a far greater Service than the oriental Languages, ſince we have very few Books written originally in thoſe Languages, which have not been perfectly well tranſlated into *Latin*. Which being not underſtood by *Bookſellers*, renders them guilty of ſeveral groſs Miſtakes, very prejudicial to their Art. For if they meet, among the old Books they buy, with ſome of the beſt Editions of the antient Fathers, in that Tongue, as they cannot underſtand it, they ſell them for Waſte-Paper; and I have found Cheeſemongers Shops ſtocked with thoſe Sort of Books; which has made me often pity the unhappy Fate of *Tertullian*, *Origen*, *Juſtinus*, *Auguſtin*, and of ſeveral other of the Fathers, whoſe ineſtimable Works, after they have been ſo long the Admiration of the learned World in general, and of the Chriſtian Church in particular, are become at laſt the Drudges of Cheeſemongers, Grocers, *&c.* and conſequently expoſed to be ſubſervient to ſome viler Purpoſes. The great Veneration I have for thoſe firſt Defenders of the Chriſtian Religion, againſt the Impieties of Paganiſm, and the Devaſtations and Rage of Hereſy, has often made me take Compaſſion of them, and ſave them from Contempt. *Toland*'s Chriſtianity, the religious and devout Reflections of *Woolſton* on the Miracles of Chriſt; and the Doctrine of the late B—p of *B——r* on the Trinity, will take Place in a *Bookſeller*'s Shop of thoſe divine Writers. Why? becauſe in our Antichriſtian Age, they are more in Vogue, and encourage Infidelity and Atheiſm. *Bookſellers* themſelves will tell you (and I am afraid, will tell Truth) that were they to lay out their Money in thoſe Sort of Books, it would be entirely dead; ſince they are not aſked for ſuch Books, in an Age; that as Piety and Devotion is confined to Perſons of a middling Rank, and of as middling a Capacity, who underſtand nothing elſe but their Common-Prayer Book, and even but very little of that, the Works of the Fathers would run the Riſque of becoming old Shopkeepers; ſince the Clergy themſelves, to whom ſuch Books more properly belong, do not ſo much as aſk if there is ſuch a Thing in Being, as the Works of the Fathers; ſome of them contenting themſelves with crowding their Libraries with Play-Books, and other Romances, for the Amuſement of their Wives and Family; therefore we are not to be ſurpriſed if Religion is almoſt out of Date, ſince it meets with ſo little Encouragement from thoſe, whoſe indiſpenſible Duty it is to be the moſt ſtrenuous Aſſerters of it. I myſelf know ſome Eccleſiaſticks, who would rather ſpend a Guinea at a Tavern, than a Quarter of the Money in a *Bookſeller*'s Shop; and who would rather take the Trouble to empty five or ſix Bottles of Wine, than to turn a Leaf of St. *Auguſtin de Civitate Dei*. They find more Entertainment in poring over a Bowl, than over the beſt Book which the Chriſtian Church has ever produced. In former Ages our Clergy were famous for their Capacity, Erudition and Learning, and *Bookſellers* were almoſt fully employed in publiſhing their Works. At preſent their Capacity may be the ſame, and I piouſly believe it is, but their Inclinations are different; however, I wiſh, with all my Heart, that for the Benefit of *Bookſellers*, and for the Edification of the Chriſtian World, they were changed.

None among us make the Traffick of valuable Books flouriſh but the Nobility and Gentry; and it ſeems as if Learning had run for Refuge to thoſe two illuſtrious Orders of the Republick; and the Palaces of the Great had become a Sanctuary for it; ſcarce any Book of Conſequence is publiſhed, but they will have a Copy of it, and none can be long in a *Bookſeller*'s Shop, without ſeeing ſomebody coming from my Lord, or Sir, or 'Squire ſuch-a-one, for ſuch a Book, which is a very laudable Emulation, and worthy of Imitation.

When *Bookſellers* deſign to publiſh any Tranſlation, they ſhould be very careful to chuſe, for that Purpoſe, Perſons who ſhould very well underſtand the Beauty of the Language to be tranſlated, and capable to enter into the Senſe of the Author; for it is abſolutely impoſſible that a Perſon who has but an indifferent Knowledge of the Language he is to tranſlate, ſhould make a faithful Tranſlation; the Want of that takes off all the Beauty of the Work, and gives it a hideous Form, which a good Judge cannot bear. Neither are they to have the Work tranſlated by ſeveral Hands, let them be ever ſo good; for the Difference of the Style, and of the Expreſſions, makes it appear as a patch'd Work, and diſcredits the whole. In *Rapin*'s Hiſtory, for Example, publiſh'd by *Mechell*, the Beginning, tranſlated by Mr. *Kelley*, is beautifully done, and really cannot be better, which expoſes the great Inaccuracy of the Middle; therefore I compare it to a cobled Shoe, whoſe upper Leather is very good, the Heel-piece tolerable, and the Sole extremely bad. The ſame cannot be ſaid of the Orations of *Cicero*, tranſlated for *Waller*; for the Tranſlator is not only perfect


Principles of Vegetation
Common Saintfoin
Trefoil
Betony
Bryony
Celandine
Germander
Chamasithies
Evergreen Hounds tongue
Colts foot
Winter Cherry
Figwort
Bears foot
Henbane
Pennyroyal
Mugwort
Navel-wort
Orisan
Mouse Ear
Lilly of the Valley
Wild Madder
Althæa
Scabious
Solomons Seal
Speed well
Saxifrage
Burnet Saxifrage
Sanicle
Viper Grass
Sea
Plants

perfect Maſter of the *Latin* Tongue, but has alſo very well enter'd into the Senſe of the inimitable Author, without loſing the leaſt of his Beauty. And the Author of one of our publick Papers has ſhewn his juſt Diſcernment, and great Sagacity, in the Judgment he has form'd of that excellent Tranſlation. Party apart which I know to be a very dangerous Point, and which carries us often farther than we can very well go, for the Safety of our Limbs, I admire both Authors, and believe that a *Bookſeller*, who conſults his Reputation, as well as his Intereſt, can employ no better.

Mr. *Chambers* finds fault with our *Bookſellers* having *Bibliopolium* written over their Doors; and well he may, ſince we cannot well approve any Thing that's needleſs, much leſs what's ridiculous: For, in Fact, what can be more ridiculous, than to have an Inſcription which ſo few People underſtand, without an Interpreter; for if paſſing through St. *Paul*'s Church-yard, a Perſon who does not underſtand *Latin* was to aſk me what ſignifies *Bibliopolium*, and I was to tell him a *Bookſeller*'s Shop, he could very reaſonably reply, that the *Bookſeller* is a Blockhead for puzzling the Paſſengers with his *Bibliopolium*, ſince every Body could very well ſee at the Appearance, and without the *Bibliopolium*, that it was not a Shoemaker's, or any other Shop, as eaſily as he could make the Difference between a Man and a Wind-mill. It is not at all ſurprizing that Stall-men dignify their Stands with the ſame Title, ſince the Little have always had an itching Humour to mimick the Great; and that I ſee no other Difference between a Stall-man and a *Bookſeller*, than what the *French* call *du plus au moins*, that a *Bookſeller* has perhaps a greater, and more ſelect Collection of Books than Stall-men, who have likewiſe this other Thing in common with *Bookſellers*, that they affect that ſullen Air, and Haughtineſs, which ſeems inſeparable from the Profeſſion in *England*; nay, even the Venders of Pick and Chuſe, in *Moorfields*, mimick it. They ſit leaning in their Stalls, adorn'd on one Side with Books, and on the other with ſome Gingerbread, Nuts, and ſuch other Commodities, with a certain careleſs, or *non chalant* Air, as if buried in the Depth of their Thought, of which they could give, as I ſuppoſe, but a very indifferent Account; and it is not without ſome Difficulty that their Cuſtomers can be favour'd with an Anſwer. This Diſtemper reaches no further than *England*; for throughout all the reſt of *Europe Bookſellers* are generally very polite and complaiſant, and treat their Cuſtomers, of what Rank ſoever, with the beſt Manners, though moſt of them are in extraordinary good Circumſtances, live very elegantly, and keep ſeveral Servants in Livery. *Petit*, *Coignard*, *Ourtemel*, *Doury*, and ſome others, at *Paris*, are Men of Fortune.

Anciently the Traffick of Books was not ſo very conſiderable, ſince *Bookſellers* in *England*, *France*, *Spain*, and other Countries, had no Shops, but only Stands, or Stalls, in the Streets, where they expos'd their Wares to Sale, like the *Bibliopoliſts*, or *Bibliopoles* of *Moorfields*; who therefore can challenge our great *Dons* for Antiquity. During this State, the Civil Magiſtrate took little Notice of *Bookſellers*, leaving the Government of them to the Univerſities, who accordingly gave them Laws and Regulations, fix'd Prices on their Books, examin'd their Correctneſs, and puniſh'd them at Diſcretion. But when, by the Invention of Printing, Books and *Bookſellers* began to multiply, it became a Matter of more Conſequence; and Sovereigns, as I have obſerv'd already, took the Direction of them into their own Hands, giving them new Statutes, appointed Officers to fix Prices, and grant Licenſes, Privileges, *&c.*

Formerly the Offices of *Bookſellers* and *Printers* were united in the ſame Perſon; but of late Days *Bookſellers* have drawn their Buſineſs into a leſs Compaſs, and leaving the Labour of compoſing Books to one Set of Perſons, and that of printing them to another, content themſelves with the gainful Part, *i. e.* if the Gain is monſtrous; otherwiſe, they are not contented. They take great Care to give little enough for a manuſcript *Copy*, often ſo little, that nothing but pure Neceſſity could oblige the *Author* to take it, while they ſell their Books at an extravagant Price. This is the general Complaint of *Authors*, which is a very juſt one. If *Bookſellers* had the leaſt Sentiment of Humanity, and the leaſt Principle of Honour, they would conſider that *Authors*, bearing the heavier Part of the Burthen, and it being impoſſible *Bookſellers* ſhould ſubſiſt without the Aſſiſtance of *Authors*, while, on the contrary, *Authors* could very well ſubſiſt as they do without the *Bookſellers* Aſſiſtance, otherwiſe they ſhould not ſubſiſt at all; they would treat them in a leſs *Turk*-like Manner, and ſcorn thoſe ſcandalous Shufflings, which are a Scandal to their Profeſſion, and oppreſſive to the *Authors*.

BOTANY.

BOTANY, from the *Greek* βοτανη, *Herb*, is a Science which treats of Plants, of their Vegetation, Origin, Parts, Nutrition, and Increaſe; of their different Kinds, Virtues, Uſes, Analyſis, and of their Maladies, and Death.

As I deſign to treat this Subject both as a *Botaniſt* and a Philoſopher, and it would not be anſwering the End I have propos'd to my ſelf to give an imperfect and ſlight Idea of Things without tracing them as far as their firſt Source and Origin, which is the common Practice of Authors, and even of thoſe who treat of any particular Subject. I'll begin this Treatiſe, by its firſt Rudiments, which is ſhewing what's meant by the Soul of Plants, and a vegetative Life.

We have not a more uncertain and *vague* Notion of any Thing, than that of *Soul* and *Life*; ſince when mention is made of Soul, we moſt commonly underſtand it a ſpiritual Subſtance, *viz.* the human Soul; as when *Chriſt* ſays, Mat. x. 28. *Fear not them which kill the Body, but are not able to kill the Soul*; and alſo, ſometimes, a corporeal one, as *Horace* expreſſes it, *Lib.* 4. *Ode* 12.

Jam veris Comites, quæ mare temperant,
Impellunt animæ lintea Thraciæ.

Theſe *Thracian Souls* are the *Thracian Winds*, of a thin Matter. Therefore a thin, and active Matter, which can give Motion to another, if contain'd, eſpecially in an organical Body, *i. e.* endu'd with organical Inſtruments, is commonly dignify'd with the Name of Soul. Hence, the animal Spirits, or the moſt ſubtle Particles of the Blood, in Brutes; and the *vegetative Subſtance*, or Spirits impatient of Reſt in Plants, are very juſtly call'd the Souls of *Brutes*, and of *Plants*.

Therefore the ambiguous Name of Soul could be better divided, than defin'd; nor can it be ſurprizing, if *Soul* be more obſcurely defin'd by *Ariſtotle*, *Lib. de Anima*, *cap.* 1. *Actus primus corporis Phyſici organici, poteſtate vitam habentis*; The firſt Act of a phyſical and organical Body, which has Life potentially, *i. e.* the firſt Perfection, which, in Man, is the Underſtanding; and ſome active and vital Principle, *viz.* the moſt ſubtle Subſtance, in the reſt of the living Bodies, endu'd with a various Apparatus of Organs,

which can exert the vital Functions, and exerts them, in Fact, as ſoon as they are inform'd with a Soul.

Moreover, it does not appear what we are to underſtand by vital Functions, and we ought to be as cautious to avoid Ambiguity, in the Notion we are to form to our ſelves of *Life*, as of *Soul*; ſince the Life of ſpiritual Subſtances ſeems to conſiſt in the ſole *Cogitation*; and God, Angels, and human Underſtanding, are ſaid to live no otherwiſe than by *Cogitation*: But what have the Lives of *Plants*, and of *Brutes*, common with *Cogitation*, or Thinking? Therefore ſeveral complain that this Definition of *Ariſtotle* is not only very obſcure, but does not ſo much as explain to us the Nature of any certain and determinate Thing; ſince it regards both corporeal and ſpiritual Subſtances.

Every Body is conſcious of this Definition of *Ariſtotle*'s being imperfect, ſince it is not evident enough that the *Plants* have within them an active Principle of their Motion, or the principal Cauſes of their Motions, no more than the Flame, which is mov'd within it ſelf, as much as the Plant; ſince, like the Plant, it wants Aliment, and, like the Plant, increaſes, when it takes that Aliment; as well as a Coal, which we call alive, when lighted; and a living Fountain, whence Water flows continually; but thoſe Appellations are metaphorical, and we want proper ones.

But, however, this is but the Idea which *Ariſtotle* gives us of the Soul in general; for when he comes to the *vegetative Soul*, which is our preſent Subject, he defines it, *Lib.* 2. *de Anim. c.* 4. *Cauſa cur res augeantur, & aluntur*; a Cauſe whereby Things are increas'd and nouriſh'd: Which Cauſe is nothing elſe but a certain ſpirituous and mobile Subſtance, whereby a Body is inwardly agitated, and the nutritive Juice diſtributed throughout all the Parts, by means of certain ſmall Pipes, and Ducts, form'd by Nature. In the Schools, the vegetative Soul is commonly defin'd, *Actus primus corporis Phyſici organici, poteſtate, vitam vegetantem habentis*; the firſt Act of a phyſical and organical Body, which has potentially a vegetative Life.

Thoſe Things have a *vegetative Life*, which are nouriſh'd, increaſe, and generate; for by Vegetation this triple Function is underſtood, *viz.* Nutrition, Increaſe, and Generation: Therefore a triple Faculty is commonly attributed to the vegetative Soul, *viz.* nouriſhing, increaſing, and generating; we'll begin by the generating Faculty.

We learn from Scripture, *Gen.* i. 11. that the Earth has been endu'd from the Beginning with a certain ſeminal Virtue to produce *Plants* and *Roots*, which Virtue proceeding from God himſelf, was not confin'd to the firſt Production of Things, but extends, likewiſe, to all future Conſequences of Times; for the *divine Word* does not fall like the human Voice, but is eternal, and always ſubſiſting, as we'll ſhew in our Treatiſe of Metaphyſicks; and the Faculty which the Earth has of producing Herbs, and all Sorts of Plants, from this Commandment, or omnipotent Word of God, *Germinet terra herbam virentem, & facientem ſemen, & lignum Pomiferum faciens fructum, juxta genus ſuum, cujus ſemen in ſemetipſo ſit ſuper terram*; Let the Earth bring forth Graſs, the Herb yielding Seed, and the Fruit-tree yielding Fruit after his Kind, whoſe Seed is in it ſelf upon the Earth.

Philoſophers aſk what can be that Virtue the Earth is ſaid to be endu'd with? If it be only an inherent Quality, whereby it produces naturally all Sorts of *Plants*, and Herbs, without the Concurrence of Seed; or if a ſeminal Virtue, or Seed muſt be adminiſter'd to it? Commonly the Schools follow the firſt Opinion, for this Reaſon, that Earth dug up very deep, and put into Pots, after a ſet Time, or Seaſon, produces ſeveral Sorts of Herbs of it ſelf, and without Seed. But though this Opinion be approv'd by the Generality, it has not, however, the leaſt Appearance of Probability on its Side; for who, conſidering with Attention the Progreſs of Nature, ſees the marvellous Mechaniſm of the Organs of *Plants*, their Fibres, Paranchyma's, Radicles, and the whole Texture of their internal, as well as external Parts, could be perſuaded to attribute it to a heavy and indigeſted Maſs of Clay, or Earth? Unleſs he be pleas'd to attribute it to a Miracle, which would be needleſs, in this Place.

Therefore it is a great deal better to ſay that *Plants* have their Origin from Seeds, which being taken from the firſt Plants, have propagated their Species, by the Creator's Will, as far as our Times, and will continue to do ſo, to the End of the World: Which Opinion is ſupported by the above quoted Words of the Scripture, *Germinet Terra herbam virentem, & facientem ſemen.* Since the Sun, Rain, the Exhalations of the Earth, and the reſt of the exterior Cauſes, are capable to excite a certain Motion, or Fermentation, in the Boſom of the Earth; but unleſs there be a Seed which contains already the Conformation of the Plant, whoſe Parts are unfolded by that Fermentation, never ſuch Fermentation or Motion can give Origin to the Plant; therefore *fecit Dominus Deus Cœlum & Terram; & omne virgultum agri, antequam oriretur in terra, omnemque herbam regionis, priuſquam germinaret*; The Lord God made the Earth, and the Heavens, and every Plant of the Field, before it was in the Earth, and every Herb of the Field before it grew, *Gen.* ii. 4, 5. which makes me conclude, that all Plants have their Origin from the Seed, and which I prove thus:

All Plants have their Origin from what contains them, actually, or potentially; which muſt be the Seed, ſince the firſt Rudiments of a Plant can be diſcovered no where elſe, nor by the naked Eye, nor even by the Help of a Microſcope; ſo that the Seed contains not only the coarſer Matter of the Plant, with its organical Parts, which have the Ratio of a Body, but a certain Spirit likewiſe, *i. e.* an active, mobile, and vegetative Subſtance, called Soul; which although, in ſome Manner aſleep, in the Grain, or Seed, is nevertheleſs excited to Motion, by the Heat of the Sun, the Warmth of the Earth, and with the Rain impregnated with Particles of volatile Salts, whereby it unfolds its Parts, and puſhes the *Plant* forward. *Ecce enim*, ſays St. *Auguſtin*, *Lib.* 3. *de Trinit. c.* 8. *breviſſimus Surculus Semen eſt; nam convenienter mandatus Terræ Arborem facit, hujus autem Surculi ſubtilius Semen, aliquod ejuſdem generis granum eſt, & hucuſque nobis viſibile. Jam vero hujus etiam grani Semen, quamvis oculis videre nequeamus, ratione tamen conjicere poſſumus: quia niſi talis aliqua vis eſſet in iſtis Elementis, non plerumque naſcerentur ex Terræ quæ ibi ſeminata non eſſent.* A ſhort Cion, or Sprig, ſays he, is a Seed; for it being ſet at a proper Time, produces a Tree; the ſmalleſt Seed of that Cion is a Grain of the ſame Kind, and hitherto viſible to us; and though we cannot diſcover with the Eye the Seed of that Grain, we nevertheleſs can form Conjectures of it; for if there was not ſome Virtue in thoſe Principles, ſeveral Things, which are not ſow'd, would never grow.

This is confirm'd by *Malpighi*'s Experiment, who having ſhut up in a glaſs Veſſel ſome Earth dug up from a very deep Place, and cover'd it with ſeveral Cloths, that it might receive the Air and Rain, but not thoſe light Seeds toſs'd in the Air; that Earth never produc'd any Graſs, or Herbs. Therefore Plants cannot have their Origin from the Earth alone, without the Concurrence of Seed.

If it be objected, that *Plants* grow where no Body has ever throw'd any Seed; I'll anſwer, that though no Body has ever throw'd any Seed in thoſe Places, nevertheleſs Seeds might have been carried thither by Nature; *v. gr.* the Glew which grows upon Oak-trees, has a glutinous Seed, which ſticks not only to the Bills of Birds, but likewiſe to their Feet, and in that Manner is carried to other Trees; and being conglutinated to young Branches, riſes, at laſt, into a new Tree. Perhaps the Seed of the Glew is ſhut up in the Seed of the Oak, and others in other Seeds, where

where they remain hidden, till by the Concurrence of the neceſſary Diſpoſitions they break forth outward.

Beſides, *Seeds* are alſo carried by Winds and Exhalations, not under the ſenſible Form they are commonly ſeen, but a great deal ſmaller, and through their Exiguity or Smallneſs, rendered inſenſible. For as when the Vines or Trees are in Bloſſom, their Perfume is diſperſed afar off, no doubt, but there are likewiſe ſome ſeminal Particles which break forth from *Plants*, or Flowers, and being received into certain Matrices, gives Origin to *Plants* of the ſame Kind.

Laſtly, All Sorts of *Plants* do not grow in thoſe Places, where there has been no Seed ſowed; for Example, there grows in thoſe Places no Wheat, Flax, Hemp, nor great Trees, as Oaks, Elms, Beach, *&c.* but only certain Herbs, whoſe Seeds were aſleep in the Earth, and have been excited, by the Heat of the Sun, or ſome other Cauſes.

We have all the Reaſon imaginable to believe, that by the Fecundity of the Sun, and the Culture of the Earth, Seeds are changed into a better Kind, as the Poet expreſſes it, *Georgic. Lib.* I. in the following Verſes:

Semina vidi equidem, multos medicare Serentes
Et nitro prius, & nigra perfundere Amurca:
Grandior ut Fœtus ſiliquis fallacibus eſſet.

They likewiſe can degenerate, or through the Sterility of the Soil, or the Negligence of the Huſbandman, as the ſame Poet is pleaſed to inform us in the ſame Place.

Vidi lecta diu, & multo ſpectata Labore,
Degenerare tamen, ni Vis humana quotannis
Maxima quæque Manu legeret.

And *Eclog.* 5.

Grandia ſæpe quibus mandavimus hordea Sulcis,
Infelix Lolium, & ſteriles dominantur Avenæ.

It might be objected likewiſe, that ſome *Plants* grow, or from a Sprig or Layer ſet into the Earth, or from a Root or Cion grafted into another *Plant*; and that therefore all *Plants* do not grow from Seed.

The Anſwer to this Objection is, that though *Plants* grow from a Layer, a Root, or a Cion, that Layer, Root, or Cion had their firſt Origin from Seed; and therefore 'tis certain, that from the Creation of the World *Plants* have been propagated, to this Time, by a ſeminal Virtue.

If I be aſked the Definition of this ſeminal or generative Faculty, whereby *Plants* are underſtood to be produced by other *Plants*; I'll anſwer, that this Faculty is defined, a Power of the Vegetative Soul, by which it lives, and produces its Likeneſs for the Preſervation of the Species; but, in my Opinion, that Faculty is not diſcernable, from the Seed itſelf, nor from the Spirit contained therein; for as the Seed is ſaid, in the Schools, to be a Part of ſome Subſtance deſigned for the Production of another Subſtance of the ſame Species, it is not abſolutely neceſſary to diſtinguiſh that prolifick Virtue, nor from the Seed itſelf, nor from the Spirit contained in it. For after the Seed is ſewed and ſoftened by the Warmth and Humidity of the Earth; its *Germ*, wherein the *Plant* is contained, as in an Epitome, is unfolded by a gentle Fermentation, and riſes into a *Plant*.

This *Germ*, according to Dr. *Grew*'s *Anatom. Plant.* c. 1. has two Parts, *viz.* the *Radicle*, which is the Embrio, or Beginning of the Root, and the Plumule, becauſe in the Shape of a ſmall Bundle of Feathers; which in the Vegetation forms the Stalk or Trunk, and the Branches of the *Plant*.

There are beſides in the Body of each Seed two Lobes or Parts, which the Bud is wrapp'd in, and whence it draws its Nutrition, like a Chicken from the Yolk of an Egg, or an Embrio from the *Placenta*.

From the ſofteſt and more ſpongious Part of the Seed, which Dr. *Grew* calls *Parenchyma*, are formed the Marrow and Skin, and from the moſt ſolid and compact Part, the ligneous Body.

Having thus examined the Seed, we'll ſow it and examine the Proceſs of Nature in the Vegetation.

Since vegetable Bodies want Food for their Nutrition, they muſt of Neceſſity have organical Veſſels, or Ducts, to elaborate and perfect that Food, and to percolate it through the whole Subſtance; therefore we muſt endeavour to diſcover the Nature, Texture, and Symetry of thoſe Parts; their Uſes, and reſpective Functions.

To proceed with ſome Order in this curious Diſcovery, we'll begin by giving firſt the Definition of *Vegetation*, which is a Fermentation excited in the Earth, by its Warmth and Humidity, and the Heat of the Sun of different ſaline Particles, proper to unfold the different Parts of the *Plant*, contained in the Seed, as in an Embryo; and by their Rarefaction and Exaltation, form the Juices, which ſerve for the Nutrition and Growth of the *Plant*.

That the Heat of the Sun, and the temperate Warmth and Humidity of the Earth, are the firſt Principles of Vegetation, appears from the Sterility or Fertility of the Soil in thoſe Climates, where thoſe two principal Agents act, or do not act in Concert; ſince in the moſt Northern Countries, where the Humidity of the Soil is exceſſive, and its natural Warmth too much concenter'd, the Fermentation of the *Seed* being made with too much Precipitation, and without that Gradation neceſſary for the eaſy and moſt perfect Exploſion of the different Parts of the *Plant* thereby, they are fruſtrated of that Strength they ſhould have, before they come out of the *Matrix* it has been formed in, to reſiſt the Injuries of the Air; and the Inconſtancy of the Seaſons, it periſhes almoſt as ſoon as it appears on the Surface of the Earth; for though the Earth has in ſome Meaſure, though very imperfectly acted its Part, as it cannot alone, and without the Aſſiſtance of the Sun, carry the *Plant* to its laſt Perfection; that tender Parent of Nature, by the Obliquity of its Situation, being reduced to the Incapacity of darting its Rays as favourably and abundantly in thoſe Climates, as he does in others happier ſituated, cannot either help the Mother Earth in her Pregnancy, nor rectify what ſhe has left imperfect in her Productions, which therefore die almoſt as ſoon as Nature itſelf is appriſed of their Exiſtence.

Likewiſe in thoſe other Climates, ſituated quite oppoſite to theſe, where the Sun by being too profuſe of his Influences, penetrate the inmoſt Parts of the Womb of the Earth, and by its too violent and too often repeated Acts, and exalting its Salts, and evaporating its radical Humidity, cauſes an exceſſive Dilatation of its Pores, a Diſunion, and but too often an entire Laceration of its generative Parts, ſo as to render them quite imbecile, barren, or ſterile, and therefore uncapable to contribute to that Fermentation abſolutely neceſſary for the Production of *Plants*; or if the Earth retains yet ſome Principle of Fecundity, it is ſo very weak, appear rather like Abortions than perfect Fœtus's, and as ſuch, wither, and come to nothing.

On the contrary, in thoſe happy Climates, where the Earth is placed at ſo juſt a Diſtance from the Sun, as to be under his moſt favourable Aſpect, and expoſed to none but his moſt benign Influences, it almoſt always continues in its natural flouriſhing State of Health; ſeldom viſited by the moſt powerful and penetrating Beams of the Sun, but at thoſe regular and periodical Times, appointed by Nature for its Pregnancy, when they are neceſſary, or for to excite her Fecundity, or to help her in her Labour, or to nouriſh and cheriſh her Productions when once brought forth. If by the Rage and Fury of the *Aquilons*, the Inclemency of the Air, or the Inconſtancy of

of the Seaſons, the *Plants* while yet young, and conſequently more expoſed to Dangers, ſuffer ſome notable Changes or Alterations; the Sun, like a careful and diligent Phyſician, runs to their Aſſiſtance, adminiſters the neceſſary Remedies, and reſtores them, if poſſible, to their priſtine State of Health; he is as careful of the Mother Earth, and as aſſiduous in aſſiſting her in the different Infirmities ſhe is ſubject to, applying always the moſt proper Remedy, which is a graduate Heat, appropriated to the different Symptoms.

We'll ſuppoſe, here, our Seed to have been ſowed in this laſt Soil, under that favourable Aſpect of the Sun, and favoured with thoſe his moſt benign Influences. Therefore let's bury ourſelves, for a ſhort Time, in that Soil, and examine with Attention the Progreſs of the Seed in its *Matrix*, and the different Changes it undergoes in the Formation of the *Fœtus*.

The firſt Thing which preſents itſelf to my Imagination, is the Sun, and Earth, concerting together, the one by his Heat, and the other by her Moiſture, how to rid the Embryo of that hard tough Envelope 'tis wrapp'd in, and which is the greateſt Obſtacle, to the Exploſion of its Parts; therefore the Earth, which is the firſt Agent in this Caſe, and which is to do the Office of *Incubation*, makes Uſe, firſt, of its natural Moiſture, to ſoften the outer Rind or Huſk, by having it percolated through the Pores or Pipes of the ſaid Huſk, whereby they are ſo opened and dilated, as to facilitate the Introduction of the different Salts appointed to operate on the whole Subſtance of the Seed, by unfolding the different Parts it contains, and diſpoſing them ſeverally towards aſſuming their reſpective Forms.

It cannot be imagined that the Earth acts alone in this firſt Operation; that it could direct itſelf to Action without the Concurrence of the Sun; which on this Occaſion excites, by a gentle Warmth, the different Salts, the Moiſture of the Earth is impregnated with, that they may be capable to conquer the Stubbornneſs of the Huſk, by forcing themſelves, firſt into its almoſt imperceptible Pores, conquering all the Obſtacles, and raiſing all the Obſtructions, which the ſeveral Subſtances, to be ſent from the Womb, for the Nutrition and Increaſe of the Fœtus, could meet with, to obſtruct their Motions.

By this Means a free Paſſage being opened, for ſuch a Quantity of the Moiſture of the *Matrix*, as is neceſſary to make a due Separation of the Huſk from the moſt eſſential Part of the Seed, the Salts, employed in that Operation, being volatilized, or already fixed on that eſſential Part, leave the Huſk filled with nothing elſe but the *Lympha*, which groweth *turgid*, and being deprived of the Nouriſhment it received, when united to the Subſtance of the Seed, begins to tend towards its Diſſolution.

Moſt *Botaniſts* pretend, that this whole Operation is effected the firſt Day the Seed is put into the Earth, which muſt be an Abſurdity on their Side, ſince it is impoſſible to determine, preciſely, the Time Nature takes in her ſeveral Operations on the Seed; ſince its Preparation in the Earth is ſooner or later accompliſhed, as the ſeveral Agents which are to concur to it, are more or leſs diſpoſed. 'Tis my Opinion that the Production of the *Plant* can be accelerated or retarded, by Accidents proceeding from the Inconſtancy of the Seaſons, or the Quality of the Soil; ſince there are Soils more fertile than others, and again, there are Soils, which are not fit for the *Vegetation* of all Sort of Seeds, indifferently; we know by a continual Experience, that the beſt Seeds, and the moſt proper for Vegetation, when ſowed into ſome Soils, either remains buried in the Womb of the Earth, without being ſenſible of Incubation, or if they are, never come to Perfection. There are ſome Sort of Soils likewiſe, which though fertile of themſelves, are very tedious in their Productions, and bring forth a great deal later than others; ſome cannot operate without the Concurrence of the Salts, Rain-Water is impregnated with, and others can. This is interrupted in the Middle of its Operation, either by the Abſence of its Aſſociate the Sun, or by an unexpected Froſt, or tedious Rains, *&c.* and that, by bleak Winds, or a too ſcorching Heat, whereby 'tis robb'd of Part of its Moiſture. Therefore how can any Body fix a Term for the different Operations of the Earth, ſo far as to have the Temerity to ſay, this is the Work of the firſt Day, that of the ſecond, *&c.* while we muſt be convinced of the Uncertainty of thoſe Operations. Myſelf have ſeen Seed, which had been ſix or ſeven Days in the Earth, without having undergone the leaſt Change, or Alteration; and ſome of the ſame Seed, ſow'd in another Place, at the ſame Time, grown turgid, in the Space of 24 Hours.

The thicker, is the Huſk, and the cloſer the Parts 'tis compos'd of, are coadunated together, the longer Time it takes to be impregnated with the Vapours and Exhalations of the Earth, and the longer it adheres to the *Pulp*, or *Fleſh* of the Seed This Coadunation of its Parts retards, likewiſe, its Laceration, which is of an indiſpenſible Neceſſity, for the entire Exploſion of the firſt Rudiments of the Plants contain'd in the *Germ*; which Laceration does not happen till the Continuity, which ſubſiſted between the Pipes, or Pores of the Huſk, by their being extended, or dilated out of Meaſure, by the Lympha they are fill'd with, is broken; which *Malpighi* ſuppoſes to happen in a Grain of Wheat the firſt Day 'tis ſown, at which Time the *Pulp*, or *Fleſh*, ſwells, and not only the Gem, or Sprout (which is to be the future Stem) opens, and waxes green; but the Roots begin to bunch out, whence the *Placenta*, or Seed-leaf, becoming looſe, gapes. Though, in my Opinion, the *Pulp*, or *Fleſh* of the Seed, ſwells, before the Laceration of the Huſk; and by its Swelling accelerates that Laceration. For it cannot be ſuppos'd that the Salts which have penetrated through the Pores of the Huſk, to the Pulp of the Seed, and which are deſign'd for the Separation of the different Parts of the *Plant* contain'd therein, lies idle, till that Laceration has happen'd; elſe the Pulp would be expos'd to the ſame Accidents the Huſk is expos'd to; and being of a tenderer Subſtance, would ſooner be deſtroy'd, or annihilated, than the Huſk. On the contrary, the Huſk, or Rind, never break, than when all the Parts of the *Plant* are unfolded, and the organical Veſſels ſo well form'd and diſpos'd, as to be capable to aſſiſt each other in their mutual Growth; which is evident, being often brought out of the Earth adhering yet to the *Gem*; as we ſee a young Chicken newly hatch'd running with the Shell of the Egg ſticking yet on his Back.

The Formation of the *Plant* being ſo far conducted by *Vegetation*, and its Organs diſpos'd for their reſpective Functions, the Sun, by his Heat, impregnates the nutritive Juices, ſupplied by the Earth, for the Nutrition and Increaſe of the *Plant*, with a Principle of Life, more perfect ſtill than that it had receiv'd in the Incubation, by exalting and volatilizing their different Salts, whereby they are render'd capable of circulating through all the Parts of the *Plant*, and rid themſelves of the terreſtrial *Feces*, which could obſtruct that Circulation. By the Analogy which ſubſiſts between that Principle of Life, and the daily Influence of the Sun, temperated with the radical Humidity of the Juices, the ſuperior Parts are inſenſibly, and by Degrees carried upwards; while the inferior ones, different from thoſe of the animal Body, adhering ſtill ſtronger to the Matrix, than when the whole Plant was confin'd in it, ſupply it with the maternal Aliment, wherewith being fed themſelves, after it has been elaborated and perfected by the Circulation, they acquire, like the other Parts, new Strength, till, like the reſt, they are arriv'd at their full Growth.

The *Plant* increaſing in Bigneſs, and its Bud, or Stem, becoming taller, from whitiſh turns greeniſh; the lateral Roots, alſo, break forth greeniſh, and pyramidal, from the gaping Sheath, which adhered cloſely to the Plant, and the lower Root grows longer, and

and hairy, with many Fibres ſhooting out of the ſame, though there are Hairs hanging all along on all the Roots, except on their Tips, and theſe Fibres are ſeen to wind about the ſaline Particles of the Soil, little Lumps of Earth, *&c.* like Ivy; whence they grow curl'd: About the lateral Root there now breaks out two other little ones, and this *Malpighi* ſays is the Operation of the third Day.

On the fourth, continues he, the Stem mounting upwards, makes a right Angle with the ſeminal Leaf; the laſt Root puts forth more, and the other growing larger, are cloathed with more Hairs, which ſtreightly embrace the Lumps of Earth; and where they meet with any Vacuity, unite into a kind of Net-work. The Conglobate, or Flower-Leaf, is now ſofter; and when bruis'd yields a white ſweetiſh Juice, like Barley Cream. By ſtripping it off, the Root and Stem of the Plant are plainly ſeen, with the intermediate Knot, whoſe outer Part is ſolid, like a Bark, and the inner more ſoft, and medullary.

The fifth Day, in the Opinion of our Author, the Stalk ſtill riſing, puts forth a permanent, or ſtable Leaf, which is green and folded; the Roots grow longer, and there appears a new Tumour of a future Root; the outer, or Sheath-Leaf, is looſen'd, and the Seed-Leaf begins to fade.

The ſixth Day the ſtable Leaf being looſen'd, the Plant mounts upwards, the Sheath-Leaf ſtill cleaving about it, like a Bark. The Seed-Leaf is now ſeen ſinuous, or wrinkled, and faded; and this being cut, or freed from the Secundine, or Huſk, the Fleſh, or *Pericarpium*, is found of a different Texture, the outer Part, whereby the outer Part of the Seed, or Grain, is heav'd up, being more ſolid; but the Inſide veſicular, and fill'd with Humour, eſpecially that Part near the Navel-knot. All the Leaves being pull'd off, the Roots torn, and the Flower-Leaf remov'd, the Trunk appears; wherein, not far from the Roots, the Navel-knot bunches out, which is ſolid, and hard to cut: Above there is the Mark of the Sheath-Leaf, which was pull'd off; and underneath, as in an Arm-pit, where the Gem is often hid. The Hind-part of the Plant ſhews the breaking forth of the Roots, likewiſe the faded *Placenta*, *&c.*

After the eleventh Day, the Seed-Leaf, as yet ſticking to the Plant, is crumpled, and almoſt corrupted; within it is hollow, and about the Secundine, the mucous, and white Subſtance of the Seed, being continu'd to the Navel-knot, forms a Cavity. All the Roots becoming longer, put forth new Branches out of their Sides; the Seed-Leaf withers, and its Veſicles are emptied, the Internodes, or Spaces between the Knots, grow longer, new Gems appear, and the middle Root grows ſeveral Inches long. After a Month, the Roots and Stalk being grown much longer, new Buds break out at the firſt Knot, and little Tumours bunch out, which at length break into Roots.

Thus the *Plant* is hurried in this ſhort Space of Time, by *Malpighi*, through theſe various Changes and Mutations, which though real, and as ſenſible as he is pleas'd to repreſent them, are not accompliſhed with ſuch Celerity in all Sorts of *Plants*, nor even in a Grain of Wheat, which he takes for Example, for the Reaſons above mention'd; though in ſome Sorts of Plants all thoſe Variations happen in a ſhorter Time.

The *Plant* carried thus far, wants Food for the Preſervation of its vegetable Life, which being depriv'd of, it cannot ſubſiſt; of which the Naturaliſts are ſo ſenſible, that their common Opinion is, that Water is the great vegetable Food, which they endeavour to confirm, by often-repeated Experiments, eſpecially by that made on a Sprig of Balm, Mint, or the like Plant; which being ſet in a Phial of pure Water, without any Mixture of Earth, grow, and put forth Roots, Leaves, and Branches; without conſidering that thoſe ſort of Plants being of a ſhort Duration, the Juices, which they have receiv'd from their Mother Earth, in their firſt Formation, circulating through their Veſſels, being continually recruited by the Salts, the Water they are ſet in is impregnated with, together with thoſe they receive continually from the ambient Atmoſphere, are more than ſufficient for the Support of their ſhort Life in the Water, which ſubſiſt no longer than that Water continues to ſupply them with Salts, of which, when once exhauſted, it grows viſcous, obſtructs the Pores of the Veſſels, and hinders thereby the Admiſſion of Salts, even from the Atmoſphere, imbecillitate, by Degrees, the Functions of the vegetative Soul; which being forc'd, for ſome Time, to feed on its own Subſtance, becomes, at laſt, enervated and impotent, whereby the Plant withers and dies for want of Food, unleſs the Water is changed before it comes to the laſt Period; which appears at its growing offenſive to the Smell; even that Precaution becomes uſeleſs, at leaſt for the greateſt Part, thoſe Salts the Water is impregnated with being heterogeneous to thoſe which enter into the Compoſition of the Juices which circulate through the Veſſels of the Plant, have ſoon, by diſordering the whole Frame of that Mechaniſm, procur'd the Extinction of the *Plant*. The great Quantity of the oleaginous Particles thoſe Sorts of Plants are compos'd of, which keep their Pores extreamly dilated, for the Admiſſion of Salts, and other nutritive Particles, contribute much towards the Production of this *Phænomenon*. But in Plants of a cloſer Texture, whoſe Pores are ſo exiguous, as not to be forc'd but by the Impetuoſity of Salts, exalted, and volatiliz'd beſt by the Warmth of the Earth, and the Heat of the Sun, this Experiment is of no Effect. Therefore Water cannot be conſider'd as the great vegetable Food.

However, Dr. *Woodward* endeavours to aſcertain this Point, by the ſame Experiments made with Sprigs of Mint, and other like Plants, nicely weigh'd, and inclos'd in equal glaſs Phials, well cover'd up with Parchment, leaving only Room for the Stem to aſcend through it, and fill'd with Water, ſome with Spring Water, others with Rain Water, and others with *Thames* Water. At the End of 77 Days, he took them all out again, weigh'd them, as alſo the Water left, and computed the Weight of the Water expended on them, and the Proportion of the Increaſe of the Plant, to the Expence of the Water. The next Year he made freſh Experiments, with the ſame Phials, and the ſame Sort of Plants, weigh'd as before, only ſome were fill'd with *Hyde-Park* Conduit Water alone, others with the ſame Water, and a certain Quantity of Garden Earth diſſolv'd in it, and others with the ſame Water diſtill'd: At the End of 56 Days, he weigh'd the Plants, Water, *&c.* and computed what each Plant had gain'd, what Quantity of Water was expended on the Plant, and the Proportion of the Increaſe of the Plant to the Decreaſe of the Water. The Obſervations and Reflections of Dr. *Woodward* in theſe Experiments, do not appear to me very ſatisfactory; but, however, I'll give them, as I have them from himſelf.

The Doctor is not pleas'd to inform us firſt of the different Changes or Alterations that happen'd in his different Phials; but he begins by obſerving, that the leſs Plants of the ſame Kind are in Bulk, the ſmaller Quantity of the fluid Maſs, in which they are ſet, is drawn off; which ſeems plauſible enough of it ſelf, without being ſupported with the Authority of ſo great a Man; ſince it cannot be ſuppos'd that the ſame Quantity of vegetable Matter will equally ſupply the Wants of two vegetable Bodies of a different Size; ſince the organical Veſſels of that of a greater Bulk muſt be more numerous, (the Number of thoſe Veſſels is not determin'd in the vegetable, as they are in the animal Body) or larger, or longer, and make a great many more Circumvolutions, than in that of a ſmaller Bulk. If they be in a greater Number, a greater Quantity of Juice is wanted, that each of them might have its due Portion thereof, in order to have it diſtributed to the ſeveral Parts of the vegetable Body they are aſſign'd to for its Nutrition and Increaſe; and if they are bigger, or longer, they muſt be ſuppos'd

to contain more Matter, and conſequently to want a greater Supply of Food, that they might not feed on the firſt Principle of Vegetation, and thereby diſorder the whole Mechaniſm; without mentioning that by their greater Number, Bulk, and Length, is made a greater Diſſipation in the Circulation of the Juices, of the moſt volatile Particles of the Salts they are impregnated with, occaſion'd, or by the long Interval of their periodical Rotation, or by the great Number of their Pores; which is confirm'd by Dr. *Woodward* himſelf, in his ſecond Reflection upon his Experiments: For he ſays, that the greater Part of the fluid Maſs drawn off by the *Plants*, and convey'd into it, does not ſettle, or abide there, but paſſes through their Pores, and exhales up into the Atmoſphere. That the Water, in theſe Experiments, aſcended only through the Veſſels of the *Plants*, is certain; ſince ſome Glaſſes which had no Plants in them, though diſpos'd in like manner as the reſt, remain'd, at the End of the Experiment, as at firſt, without any Diminution of Water; and that the greateſt Part flies off from the *Plant* into the Atmoſphere, is as certain.

Theſe *Phænomena* are alſo evident enough of themſelves, without being oblig'd to have Recourſe to long and tedious Experiments for it; for if it be true that the *Plants* receive their Nutrition and Increaſe from the Water, there muſt be a Diſſipation made of the different Particles the Water is compos'd of, and that Diſſipation muſt leſſen its Quantity more or leſs, as the Diſſipation is greater or leſſer. But I cannot be of Dr. *Woodward*'s Opinion, that the fluid Maſs aſcends up the Veſſels of the *Plants*, in much the ſame Manner as up a Filtre; for I would rather believe, that the ſaline Particles of the Water, having a natural Analogy with thoſe Juices the *Plants* are impregnated with, and being thrown into a Fermentation by the Corpuſcles emitted through the Pores of the Plants, are hook'd in by the ſaid Corpuſcles, and carried along with them through the ſame Pores they had exhal'd from, for to recruit the vegetable Juices; which continual Emiſſion and Intromiſſion, conſtitute the Atmoſphere the Plants is wrapp'd in, and which ſubſiſts no longer than the Water can ſupply the Plants with thoſe ſaline Particles, of which, when entirely diveſted, the Atmoſphere falls of it ſelf by Degrees, and the vegetable Juices being thereby depriv'd of their neceſſary Supply, exhauſt themſelves; and the *Plant* being depriv'd of Food, muſt die at laſt. That Part of the fluid Maſs left in the Bottles, is nothing elſe but the moſt phlegmatick Particles of the whole Maſs. 'Tis no Wonder if there happen no ſenſible Diminution of the Water in the Phials, where there is no *Plant*, ſince there is, then, no other Diſſipation of the Particles, 'tis compos'd of, but the very ſmall, and inſenſible one, occaſion'd by the natural Fermentation of the whole.

Dr. *Woodward* found, that the leaſt Proportion of the Water expended, was to the Augment of the *Plant*, as 46 or 50 to 1; and in ſome 100, 200, nay, in one, as 700 to 1. But he is not pleas'd to tell us in which of his Phials the greateſt Diminution happen'd, which is a very eſſential Circumſtance of the whole Experiment, (or elſe Mr. *Chambers*, who entertains us with it, has ignorantly omitted it, as he does in a vaſt Number of other Caſes) for we may reaſonably ſuppoſe that the Doctor made choice of different Sorts of Water with no other Deſign, than to diſcover thereby ſome Difference in their Diminution, or which, of the *Thames*, *Hyde-Park* Conduit, or diſtill'd Water, could afford more or leſs Food to the Plants. Therefore I'll take the Liberty to anſwer this *Quære*, by a Suppoſition that the Water which was the moſt impregnated with ſaline Particles, analogous to thoſe of the Juices of the *Plant*, ſuffer'd a greater Diminution, and by ſupplying the *Plant* with a greater Quantity of wholſome Food, kept it longer in a flouriſhing State of Health, which I ſuppoſe to have been the Qualities of the Water of *Hyde-Park* Conduit, excluſively of the two others; ſince the *Thames* Water being impregnated with a vaſt Quantity of acrimonious Salts by the ebbing of the Sea, thoſe Salts muſt lacerate the inner Coat of the organick Veſſels, and render the *Plants* cacochimous, and of a ſhort Duration, and ſhorter ſtill, in the ſtilled Water, which, being diveſted of its ſaline Particles by Diſtillations, cannot ſupply the *Plants* but with lymphatick ones, to temperate the too great Rapidity of the vegetable Juices, and which cannot be ſuppoſed the neceſſary Food. Therefore the Diminution muſt be leſſer of the ſtill'd Water, than of the *Thames* Water, and leſſer of the *Thames* Water, than of the Water of *Hyde-Park* Conduit.

The ſame Author ſays, that Part of the Humidity, which he ſuppoſes to aſcend up the Veſſels of the *Plant*, paſſes through their Pores, and exhales up into our Atmoſphere, and carries with it many Parts of the ſame Nature, with thoſe whereof the *Plant*, through which it paſſes, conſiſts; that the groſſer indeed are not ſo eaſily born up into the Atmoſphere, but are uſually depoſited on the Surface of Leaves, Flowers, and other Parts of the *Plant*; whence our Manna's, our Honeys, and other gummous Exudations of Vegetables; but that the finer and lighter Parts are with greater Eaſe ſent up into the Atmoſphere, thence they are conveyed to our Organs of Smell; by the Air we draw in Reſpiration, and are pleaſant or offenſive, beneficent, or injurious to us, according to the Nature of the *Plant* from which they ariſe. And ſince, concludes he, theſe owe their Riſe to the Water that aſcends out of the Earth, through the Bodies of *Plants*; we cannot be far to ſeek for the Cauſe why they are more numerous in the Air, and a greater Quantity is found exhaling from Vegetables in warm humid Seaſons, than in any others.

I reject this whole Reaſoning as entirely contrary to the true Principles of natural Philoſophy, for the following Reaſons. 1. There is not the leaſt Reaſon to ſuppoſe, that the Humidity, excluſively of all the other Subſtances the Earth is compoſed of, aſcends up the Veſſels of the *Plant* for its Nutrition, ſince the fluid Maſs has no other Power to direct itſelf to Motion, but what it borrows from the ſaline Particles it is impregnated with, of which once entirely diveſted, by Evaporation, it remains an unactive, heavy, and dead Maſs; 'till by a new Fermentation in the Earth, or otherwiſe it be impregnated a-new. 2. That it is not likely Nature ſhould make uſe of ſo heavy a Vehicle for to ſupply the Vegetable Body with Food, while the Earth can furniſh her with ſo many others, and ſo proper for the Purpoſe; as are the oleaginous, ſulphurous Subſtances 'tis compoſed of, and which are ſo proper for Exaltation, and which once put into a Ferment, by its natural Warmth, aſſiſted therein by the Heat of the Sun, can penetrate the moſt compact Pores of the *Plants*, and unite themſelves to the nutritive Juices, between which and them there is ſo perfect an Analogy. 3. That it is very likely that thoſe Particles and Salts, in their Sublimation, can carry along with them a ſufficient Quantity of the radical Humidity, which is abſolutely neceſſary to temperate the too great Impetuoſity of the Juices in their Circulation, but it is abſurd to think that the whole Food of the vegetable Body conſiſts in that Humidity, elſe the *Plant* ſhould be always in a cacochimous Condition, as is evident from the various Accidents of the animal Body, wherein the *Lympha* ſuperabounds, is ſubject to. 4. Humidity is ſo far from being capable of the Operations which Dr. *Woodward* is pleaſed to attribute to it, that when once admitted into the *Plant*, it grows ſtill more imbecile, in being diveſted by the Circulation, or continual Rotation of the nutritive Juices, of the few elaſtick Particles, it had brought into it, and remains at laſt like a Kind of Excrement, or *Caput Mortuum*, which the moſt volatile Particles uſher out, as far as the Bark, where they leave it; and therefore, 5. It is not true, that the Humidity, in its ſuppoſed Emiſſion from the *Plant*, carries with it many Parts of the ſame Nature with thoſe of the *Plant*, through which it paſſes, conſiſts; ſince as we have proved already, that Humidity has

no

no Elaſticity, and if it was even poſſible it could be emitted from the *Plant*, diveſted as it muſt be, then, of its ſaline Particles, it could not enter into the Compoſition of our Atmoſphere, but muſt fall of itſelf, as a dead Weight. Thoſe Parts which Dr. *Woodward* obſerves depoſited on the Surface of the Leaves, Flowers, and other Parts of the *Plants*, which he is pleaſed to ſtile the groſſer Particles of the Humidity, impregnated with Particles of the ſame Nature, whereof the *Plants* conſiſt, are nothing elſe but the oleaginous and ſulphureous Particles, which compoſe the Atmoſphere of the *Plant*, and which overburthened with their own Weight, as well as with that of the Particles of the Plant, they have gathered in their Ingreſs and Regreſs through it, reſt themſelves on the outer Parts of the *Plant*; and form our Manna's, Honeys, and other gummous Exudations; which is far more probable than to ſay, that they conſiſt of humid Particles, impregnated with the Parts of the *Plant*, ſince moſt of thoſe Subſtances are ſubject to a Liquefaction by Heat. 6. If a greater Quantity of Odours is found exhaling from Vegetables in humid Weather than in any others, 'tis not becauſe the Air is impregnated with the humid Particles, which have paſſed through the *Plant*, but rather, by the ſulphurous ones, which chiefly compoſe the Atmoſphere of the *Plants*, and which ſtrike more powerfully our Organs of Smell in humid Seaſons, than in any others, becauſe, then the Atmoſphere is more condenſated, and conſequently are nearer us than in another Seaſon.

Dr. *Woodward* endeavours to ſupport his Sentiment with the Example of Countries covered with Trees, and the larger Vegetables, which are more obnoxious to Damps, great Humidity in the Air, and more frequent Rains than others that are more open and free. The great Moiſture in the Air, ſays he, was a great Inconvenience and Annoyance to thoſe who firſt ſettled in *America*, which at that Time was over grown with Woods and Groves; but as theſe were burned and deſtroyed, to make Way for Habitations, and Culture of the Earth; the Air mended, changed into a Temper, much more ſerene and dry than before.

Ay; but by your Leave Dr. *Woodward*, we are not to conclude from thence, that thoſe Damps and Rains proceeded from the Humidity exhaled from the *Plants* or Trees, but rather from the Exhalations of the Earth, which, overſhadowed by thoſe thick Foreſts, impenetrable to the Rays of the Sun, cannot be evaporated by its Heat, but on the contrary, are reſolved into Rain by the leaſt Agitation of the Atmoſphere.

In the Phial where Dr. *Woodward* had mixed Earth with Water, he found that there was much more of terreſtrial Matter, at the End of the Experiment, left in the Water of the Glaſſes, that had no *Plants* in them, than in thoſe which had *Plants*. That the Garden-mould, diſſolved in ſome of the Glaſſes, was conſiderably diminiſhed and carried off, nay that the terreſtrial and vegetable Matter was born up in the Tubes filled with Sand, Cotton, *&c.* in that Quantity as to be evident even to Senſe; and the Bodies in the Cavities of the other Tubes, that had their lower End immerſed in Water, wherein Saffron, Cochineal, *&c.* had been infuſed; were tinged with Yellow, Purple, *&c.* To look abroad, continues he, a little towards our Shores, and Parts within the Verges of the Sea, theſe will preſent us with a large Scene of *Plants*, that, along with the Vegetable, take up into them mere mineral Matter alſo, in great Abundance; ſuch as our Sea-Purſlain, the ſeveral Sort of Algas, of Samphires, and other marine *Plants*: Thoſe contain common Sea-Salts, which are the ſame as the Foſſil, in ſuch Plenty, as not only plainly to be diſtinguiſhed on the Palate, but may be drawn out of them in conſiderable Quantity; nay, ſome affirm, there are *Plants* found that will yield Nitre and other mineral Salts?

But what is all this *Galimatias*, as the *French* call it, to the Point in Queſtion? Is not Dr. *Woodward* to prove that the humid Maſs is the natural Food of the *Plant*, and not, that it can be impregnated with mineral Particles, which no Body has ever attempted yet to deny? And will proving the Poſſibility of ſuch Impregnation, elucidate, how the Garden-Mould, diſſolved in the Water, has ſuffered Diminution? Had he not expreſſed himſelf in clearer Terms, if he had ſaid, that from the Diſſolution of the Mould in the Water a-new, an extraordinary Fermentation of the whole Mixture having enſued, the moſt volatile Particles, it was impregnated with, had been evaporated, whereby the whole Maſs had been conſiderably diminiſhed; that by that Exaltation, or Evaporation, the leſs heavy Parts of the Earth had been carried by the moſt ſubtil, as far as thoſe ſubtil Particles could find Obſtructions, to be diſengaged from them, which happened in their Paſſage through the Tubes. We have no need to take the Pains to viſit our Shores, to be convinced that the Vegetables which grow in thoſe Places contain a great Quantity of common Salts, ſince it is our Opinion, that Vegetables are fed with the ſaline Particles of the Vegetable Matter; and as thoſe Shores on which thoſe *Plants* grow are frequently viſited by the Sea, which is impregnated with nothing elſe but mineral and bituminous Salts, no wonder, if the whole Subſtance of the *Plant*, is loaded with them.

In the following Reflections Dr. *Woodward*, or Mr. *Chambers* for him, deſtroys his whole Syſtem of the vegetable Matter, though founded, as he pretends, on Experiments; for in the preceeding ones he would have us believe, that the Humidity of the Earth is the whole vegetable Matter, and in theſe he repreſents it only as a Vehicle to the vegetable Matter; for, ſays he, the vegetable Matter being very fine and light, is ſurpriſingly apt, and diſpoſed to attend Water in all its Motions, and follow it into each of its Receſſes; as appears not only from the Inſtances above alledged, but many others; he even forewarns us, that if we were to percolate it with ever ſo much Care, and to filtre it with never ſo many Filtrations, yet ſome terreſtrial Matter would remain. Himſelf, ſays he again, has filtred Water through ſeveral Sheets of thick Paper, and after that through a very cloſe fine Cloth, twelve Times double, and this over and over, and yet a conſiderable Quantity of this Matter diſcovers itſelf in the Water after all. Now if it thus paſſes, concludes he, or his Interpreter for him, Interſtices that are ſo very ſmall and fine, along with the Water, it is the leſs ſtrange, it ſhould attend it in its Paſſage through the Ducts and Veſſels of *Plants*.

We agree with you, dear Dr. *Woodward*, that the vegetable Matter is found in the Humidity of the Earth, or rather, that that Humidity is impregnated with the Particles which enter into the Compoſition of the vegetable Matter (which cannot be properly called vegetable Matter, 'till after it has been elaborated and prepared in the Veſſels of the *Plant*;) but we deny that the humid Maſs ſerves as a Vehicle to the vegetable Matter; ſince the vegetable Matter itſelf is rather a proper Vehicle to the humid Maſs, which receives its Motion from the Elaſticity of the vegetable Matter. The Experiment of Filtration proves very well that ſuch Matter is contained in Water, and that it never can entirely be ſeperated from it; and therefore proves nothing againſt us; but the Concluſion is very lame, that becauſe the moſt ſubtil Parts of the vegetable Matter are left in Water, after Filtration, it muſt be carried up the Veſſels of the *Plants* in Vegetation; for thoſe Gentlemen muſt have the Complaiſance to grant us this, that there is ſome Difference between Gravity and Elaſticity; in Filtration, it is not repugnant to Reaſon or Experience, that Water, by its own Weight, can force its Paſſage, through the Pores of the Paper, or Cloth, which while the moſt compact, are nevertheleſs apparent enough, as to be diſcernible by the naked Eye, and if they were not at firſt, they are ſoon relaxed by the Impreſſion which the Humidity makes on them, ſo as to give Paſſage to Particles of a far greater Volume than thoſe of the Water; 'Tis not ſurpriſing then, that a Sediment is found at the Bottom of the Veſſel, ſuppoſed to be

Part of the vegetable Matter; and who knows but thoſe Particles, by the Rapidity of their Motion, do not perforate firſt the Pores of the Paper, or Cloth, to facilitate a Paſſage to the reſt of the humid Maſs; which by the uninterrupted Filtration, not only hinders thoſe Pores from contracting themſelves, but dilates them more and more ſtill, even ſo far, as to procure a Paſſage to the heavier Particles. But the ſame cannot be ſaid with Reſpect to the Nutrition of the *Plant*; for in that Caſe the Weight, far from being a Help to the Water in its Motion, is rather an almoſt inſuperable Obſtacle to it; for then it muſt aſcend, and not deſcend, and therefore muſt be diſengag'd of all that gives it a Propenſity downwards, and makes it inherent to a ſtill heavier Body; unleſs there can be ſuppos'd an attractive Faculty in the Juices which circulate already through the *Plant*; which the Doctor is not pleas'd to mention, to ſupport his Sentiment. Neither do we know of any violent Heat, which by rarifying the Atmoſphere of the Water in the Earth occaſions ſo violent a Compreſſion, as to force it upwards, which we know, by a daily Experience, cannot be effected but by ſuch violent Means; and then Water, thus rais'd, cannot proceed further, but when left to it ſelf, ſeeks ſome Declivity, to follow its natural Propenſity downwards, which it does then with Impetuoſity, ſhewing, thereby, that it had been all that while in a violent State.

Water, however, though it cannot be a Vehicle to the vegetable Matter, is, nevertheleſs, very beneficial to Vegetation, ſince the aqueous Particles, carried along the vegetable ones into the Plant, moderate the too great Impetuoſity of the nutritive Juices, which, otherwiſe, by their continual Motion, would become aduſt, and outwardly cool the Pores, which, by their Friction with the ſaline Particles in their Ingreſs and Egreſs through it, could by the Condenſation of the moſt ſulphurous and viſcous, be obſtructed, and thereby the whole vegetable Subſtance be depriv'd of its Food. Therefore Water is of the ſame Uſe in this Caſe, as in the Refrigeratory of an Alembick, *i.e.* by regulating the Percolation of the nutritive Juices, which otherwiſe would flow with too great an Impetuoſity through the organical Veſſels of the Plants, hinder a too copious Exaltation of the volatile Salts they are impregnated with, which otherwiſe would cauſe a too great Diſſipation of them, and thereby prove very prejudicial to the whole Plant.

The Reaſon alledg'd by Dr. *Woodward*'s Interpreter for all the terreſtrial Matter not aſcending into the *Plant*, is, that the mineral Matter makes a great deal of it, which is not only groſs and ponderous, but ſcabrous and inflexible, and ſo not diſpos'd to enter the Pores of the Roots; and that, beſides, a great many of the ſimple vegetable Particles, by Degrees, unite, and form ſmall Clods, or *Moleculæ*, which ſtick to the Extremities of the Roots of thoſe Plants, that others of them entangled in a looſer Manner, form the *Nubeculæ*, or green Bodies, ſo commonly obſerv'd in ſtagnant Water: All which, when thus conjoin'd, are too big to enter the Pores, or aſcend up the Veſſel of Plants, which ſingly they might have done.

This appears to me a falſe Suppoſition, ſince, at leaſt in my Opinion, we have no Need to have Recourſe to the *Scabroſity* and Inflexibility of the mineral Matter which enters into the Compoſition of the Earth, to ſhew why the whole terreſtrial Matter, mix'd with the Water, does not aſcend into the Plant, when it cannot be reaſonably ſuppos'd that the Earth, being compos'd of ſeveral different Subſtances, which have all their different Qualities, thoſe Subſtances cannot be all appropriated to the Nutrition of the Plant, nor can all enter into the Compoſition of the vegetable Matter; the different Productions of the Earth, muſt convince us that it muſt have different Food appropriated to thoſe different Productions, that what contributes towards the Nutrition and Increaſe of a *Foſſil*, is not proper, perhaps, for the Nutrition and Increaſe of a Vegetable, no more than all the ſame Aliments can ſerve for Food to Men and Beaſts indifferently; therefore if all the terreſtrial Matter does not aſcend into the Plant, 'tis not becauſe kept from it by the Scabroſity and Inflexibility of the mineral Particles 'tis impregnated with, but becauſe the *Plant* takes none but thoſe with which it has a natural Analogy, and can contribute towards its Nutrition and Increaſe, without over-burthening it ſelf with crude and indigeſted Aliments, which being heterogeneous to the vegetable Juices, would cauſe ſome very great Diſorder in their admirable Symmetry. Nay, even the mineral Matter could not be an Obſtacle to its aſcending the Body of the *Plant*, no more than all the other Subſtances the terreſtrial Matter is compos'd of, ſince none of thoſe Subſtances aſcend into the *Plant*, *crude* and *undigeſted*, as they are originally; and before they have been purg'd of their *Fæces*, by the Fermentation excited in the Earth by its radical Humidity, and the Heat of the Sun; which is apparent enough at the Difference happening in the *Plants* according to the Diverſity of the Seaſons: For in Winter, when the Fermentation is but weak, and imperfect, and therefore the Exaltation of the ſaline Particles not ſo copious as in the Spring, the Plants appear to be but in a weak Condition, as if depriv'd of Part of their Food; which would not happen, if they were to feed on the terreſtrial Matter, crude and undigeſted as it is, without any other Preparation; even the mineral Matter, ſcabrous and inflexible as it is, is not excluded from the vegetable Matter; for the moſt ſubtile Particles of it, exalted as well as the reſt by the Fermentation, enter likewiſe into its Compoſition, and the ſmall Clods, or *Moleculæ*, which are found ſticking at the Extremities of the Roots of the *Plants*, is not the whole mineral Matter, but its *Fæces*, together with thoſe of all the other Subſtances the Earth is compos'd of, from which the vegetable Subſtance has been ſeparated, and which have been roll'd to the Roots, in the Efforts the volatile Particles have made to diſengage themſelves from them. This Reaſoning will alſo convince us, that the Water is not the Vehicle of the vegetable Matter; for if it was, in Winter, when the Humidity is more abundant, and conſequently more capable, by its larger Volume, to force it ſelf into the Body of the *Plant*, and to carry a greater Quantity of Food, the *Plants* ſhould appear in a more flouriſhing State of Health, when a continual Experience convinces us of the contrary; for they appear then drier, and in a more languiſhing State, than even during the moſt ſcorching Days of the Summer; which proves plainly, that though Water enters into the Compoſition of the *vegetable Matter*, it wants, notwithſtanding, another Vehicle to be carried into the *Plant*.

To prove this laſt Propoſition, that thoſe Clods, and *Moleculæ*, found at the Roots, are the mineral Matter, which could not aſcend into the *Plants*, our Antagoniſts have Recourſe to the different Operations of Agriculture, as Tilling, Ploughing, Fallowing, Harrowing, *&c.* which is done, ſay they, to break thoſe Clods, or *Moleculæ*, the better to facilitate, by being thus reduc'd to a leſſer Volume, their Entrance into the *Plant*. But they'll give me Leave, I hope, to differ from them in this, as I have done in all the reſt; for this Tilling, Ploughing, Harrowing, *&c.* is, in my Opinion, done for no other End, than, by thoſe different Operations, opening and levigating the whole Maſs, to facilitate the Fermentation for the Formation of the vegetable Matter, by the Approximation of the ſeveral Agents which are to concur in that Operation.

They pretend alſo, that this Ploughing, Harrowing, *&c.* is nothing elſe but an Imitation of Nature, and that Sea Salts, Nitre, and other Salts, promote Vegetation in the ſame Manner, by looſening the Earth, ſeparating the concreted Parts thereof, and by that Means fitting and diſpoſing them to be conſum'd by the Water, and carried up into the Seed, or *Plant*, for its Formation and Increaſe.

Nothing is more certain than the Earth is impregnated with a vaſt Quantity of nitrous Particles; but

but it is not equally certain, that thoſe nitrous Particles are capable of thoſe Operations attributed to them by our Antagoniſts; for I believe, on the contrary, that they are far from having Strength enough to operate thoſe *Phænomena* in the Earth; in which, if they were even predominant, (which we have not the leaſt Reaſon to ſuppoſe, ſince, by the frequent Analyſis made of the Earth, we find that it abounds with alkaline Salts) by their continual Friction againſt the Alkali's, they blunt their Points, and loſe almoſt entirely their diſſolving Qualities, and therefore are incapable of operating in that mechanical Manner. For if ſuch a Thing could be ſuppos'd, and the nitrous Particles were ſo predominant, and ſo active, as they muſt aſcend with the reſt of the vegetable Matter, into the *Plant*, they would produce ſuch dangerous Effects on the nutritive Juices, by diſuniting and lacerating their tender Texture, that we ſhould have very great Reaſon to deſpair of ever ſeeing any Plant carried to its full Growth. Therefore the nitrous Salts, far from being capable of thoſe violent Operations on the whole terreſtrial Maſs, are in a leſs Quantity there, than any other Salts of a different Nature; and the more abundant they are in a Soil, the leſs perfect is the vegetable Matter, and the leſs Nutrition *Plants* receive from it. For though thoſe nitrous Particles are not quite ſo pernicious then, as if they had undergone no Alteration or Changes in their Fermentation, they nevertheleſs retain yet few of their bad Qualities, and rather deſtroy than nouriſh the *Plant*.

The more a Soil is impregnated with nitrous Particles, the more Lime is ſerviceable to Vegetation in that Soil; for the Lime being an Alkali, embarraſſes and blunts in the Fermentation, the ſharp Points of the nitrous Particles, and renders it leſs prejudicial to Vegetation; and therefore ſhould be mix'd with thoſe Soils which border on the Sea: For it is ſerviceable no otherwiſe, ſince it doth not contain any Thing in it ſelf, that is of the ſame Nature with the vegetable Mould, or afford any Matter fit for the Formation of *Plants*.

All our *Naturaliſts* are pleas'd to conſider as inconceivable, how one uniform homogeneous Matter, having its Principles, or organical Parts, of the ſame Subſtance, Conſtitution, Magnitude, Figure, and Gravity, ſhould conſtitute Bodies ſo unlike, in almoſt all Reſpects, as Vegetables of different Kinds are; nay, even as the different Parts of the ſame Vegetable; that one ſhould carry a reſinous, another a milky, a third a yellow, a fourth a red Juice in its Veins. One affords a fragrant, another an offenſive Smell; one ſweet to the Taſte, another acid, bitter, acerb, auſtere, *&c.* that one ſhould be nouriſhing, another poiſonous; one purging, another aſtringent, *&c.*

Therefore I'll beg Leave to attempt, in this Place, what all others before me have left untouch'd, the Explanation of thoſe different *Phænomena*. 1. I cannot grant that the vegetable Matter is of the ſame Subſtance, even in the ſame Spot of Ground; ſince there is not that Order, Regularity, and exact Symmetry, between the Pores of the Earth, as to render the different Matrices equally well diſpos'd for the Formation of the ſeveral Subſtances which enter into the Compoſition of the whole Maſs. Some of thoſe Matrices being ſituated more advantageouſly than others, as well with Reſpect to the radical Humidity of the Earth, and the Temperature of its natural Warmth, which are the two firſt Agents which put the Matter into a Ferment, and to the Influences of the Sun, which perfects the whole. Some having their Pores too much dilated, and thereby leave a too free Egreſs to the moſt volatile Particles, hence enſue a too great Diſſipation, and thereby the whole Subſtance is exhauſted. Others having them too compact, whereby the Heat being too much contracted, the Fermentation is made with too much Precipitation, and the ſuliginous Vapours or Exhalations finding no Vent, fall back on the whole Matter, embaraſſes the different Salts in Ferment, and hinders their Separation. Therefore it cannot be expected that Subſtances thus imperfectly prepar'd, when they enter into the Compoſition of the vegetable Matter, can render it as laudable as thoſe form'd in Matrices, more perfectly diſpos'd; nor that nutritive Juices extracted from ſuch Matter, ſhould anſwer all the ſalutary Ends expected from thoſe which have a Matter of a better Conſiſtence for their Principles. Conſequently the Plant fed with two Aliments, ſo different in their Qualities, muſt likewiſe appear ſtronger or weaker in Proportion; and that fed with thoſe Juices vitiated in their Principles, be ſubject to the ſame Accidents the animal Body form'd in a vitiated *Matrix*, and fed, while in it, with corrupted Aliments, is expos'd to. Hence thoſe ill-form'd, and ſcabious Plants, which cannot be rear'd up but with the greateſt Difficulty; and, when rear'd, never appear otherwiſe than in an ill State of Health, and a decaying Condition, and almoſt as ſoon wither'd as they appear. Which Difference happens, as I have obſerv'd already, in the ſame Spot of Ground, in a Nurſery, for Example, while we find amidſt a great Number of wholſome and well-growing Plants ſeveral others, which, though from as good a Seed, ſeem always cacochimous, and never make a wholſome or fine Plant, whatever Pains and Care be taken to rear it up. 2. As for the different Subſtances contain'd in, or exuded from the Plant, that muſt be attributed to the predominant Qualities in the Juices percolated through its whole *Parenchyma*, and from the Abundance of homogeneous Particles they have been ſupplied with by the vegetable Matter; for if thoſe Particles are oleaginous and ſulphurous, and the Principle of Nutrition within the Plant of an aduſt Quality, they are condenſated ſo as to render the whole Subſtance of the Juices of a more than ordinary thicker Conſiſtence, which being ſlow in its Motion, and, on the contrary, the volatile Salts exalted from it edg'd by the firſt aduſt Principle, flowing with ſuch Precipitation as to force all Obſtacles, Part of that Subſtance is forc'd by them through the Pores of the inner Plant, to the outer. But if, on the contrary, oleaginous, lymphatick, and tartarous Particles are predominant in the Juices, they form, in Concert, that limpid Subſtance, which we ſee under different Colours, according to the different Configuration of its Pores. For if they be ſtreight, compact, or cloſely coadunated together, as they reflect the Light in direct Lines to our Sight, they appear white; if a little more obliquely, and the Pores are not ſo compact as to admit of an almoſt inſenſible Refraction, yellow; if in quite oblique Lines, and the Refraction is yet inſenſible, though greater, through a greater Dilatation of the Pores, red, *&c.* 3. As for the different Smells, they proceed from the different Shapes or Figures of the Corpuſcles which compoſe the *Atmoſphere* the Plant is wrapp'd in, and their different Manner of affecting the olfactory Nerves; for if they be globular, by only tickling it agreeably, they excite a fragrant Smell; but if ſharp, and poignant, an offenſive one, by wounding the Nerve, and cauſing in it a Sort of Convulſion. The Difference of the Taſte proceeds from the different Qualities predominant in the nutritive Juices; for if oleaginous and ſulphurous Particles are predominant, but ſo as to be very well incorporated together, without the leaſt Predominancy in either, the Plant taſtes ſweet and pleaſant; if, on the contrary, the nutritive Juices are too much impregnated with acid, nitrous, *&c.* Particles, the Taſte is bitter and acerb. Too great a Quantity of theſe Particles, which embarraſſes all others, over the whole Subſtance, whence enſues a too great, and too frequent Exaltation of them, renders, likewiſe, the Plant poiſonous; while, on the contrary, they are but in a very ſmall Quantity, and the whole Subſtance of the nutritive Juices is almoſt compos'd of nothing elſe but oleaginous, ſulphurous, and tartarous Particles, continually percolated through the whole vegetable Body, the

Plant is nouriſhing. As for their Purgative Qualities, they are to be exemplified in our Treatiſes of Chymiſtry and Pharmacy.

The more perfect of thoſe Matrices above-mentioned do not continue always in the ſame State of Perfection, for like all other Agents which have not their Principle of Action of themſelves, they are impaired at laſt, and rendered ſterile by a too great Exceſs of Fecundity. For while a Soil is expected rich and fertile, 'tis work'd off 'till it is entirely exhauſted of its moſt eſſential Particles, and the Matrices, for want of Matter to work upon, and for having worked beyond their Strength, are rendered uſeleſs, which appeared at the Soils becoming ſterile from fertile, it was before; but then, by leaving it at Reſt for ſome Time, and afterwards meliorating it, and working it a-new to excite a new Fermentation, it often recovers its former Fecundity; new Matrices are formed by a new Arrangement of the Parts for the Preparations of the Subſtances, which are to enter into the Compoſition of the vegetable Matter, provided the Soil has not been entirely exhauſted at firſt of the ſaline Particles, which is not impoſſible, for then all the Preparations imaginable could not reſtore it to its priſtine Fecundity; hence thoſe Soils, which have been fertile once, remaining barren and ſterile, notwithſtanding the Skill, Labour, or Induſtry of the Huſbandman; hence thoſe others, which though they are brought to bear again, can never produce the ſame *Plants* as before; and hence ſome, which once almoſt fertile of themſelves, can never produce afterwards any *Plant* whatever, without the Aſſiſtance of the Art, and a very aſſiduous Labour.

There are Soils ſo fecund, that they continue ſo for ſeveral Ages, ſupplying always the *Plants* with enough of vegetable Matter, as to keep them always in the ſame flouriſhing State of Health, as it happen in Foreſts, where we ſee Trees which have ſtood for a long Series of Years, in the ſame State, without any viſible Alteration; and never change but when their organical Veſſels, relaxed, or contracted by Age, are reduced to the Incapacity of performing any longer their natural Functions. 'Tis true, that when a *Plant* is arrived once at its full Growth, it wants then but very little Nutrition; though we ſee in ſome other Soils, that *Plants*, which have grown to Perfection, degenerate all on a ſudden, and fall to Decay before their Time, which cannot be attributed but to the Earth having enervated itſelf in ſupplying them with Aliment; or to the *Plants*, by having been provided thus plentifully, having ſhot forth too many Branches and Roots, whereby they become at laſt too chargeable to their Hoſt. Though Huſbandmen have found a Remedy againſt thoſe Evils, and which is retrenching Parts of the Branches, but more eſpecially the Roots, whereby the Earth is eaſed of Part of its Burthen. But however theſe Expedients are not always attended with the deſired Succeſs; and there is often no other Way left to ſave the *Plant* than by tranſplanting it into another Place.

That *Plants*, when arrived at their full Growth, do not want ſo great a Quantity of vegetable Matter, as when it firſt begins growing, is evident, from ſome Soils in which young *Plants* cannot be reared up, even with the greateſt Art and Induſtry, but thrives very well, when once arrived at a certain Degree of Perfection, of which we have an Example in the Soil of the Park of *Verſailles*, near *Paris*, which could never bring forth a young *Plant*, but keeps in very good Condition thoſe already grown in another Soil, and tranſplanted there.

The Earth is alſo very much aſſiſted in the Vegetation by the Rain-Water, which being nothing elſe but the Exhalations of the ſame Earth, condenſated in the middle Region of the Air, and afterwards reſolved into Water by the Agitation of the Atmoſphere, reſtore to the Earth the moſt ſubtil of its ſublime Particles the Rays of the Sun had robbed her of. Thoſe Particles having received in that Exhalation a more perfect Rarefaction than thoſe elaborated in the Matrices of the Earth, as having been more immediately under the Influences of the Sun, bring back a new Treaſure to their Mother Earth, which enriches it with new Principles of Activity, which are of a great Succour for making her bring forth quicker its Productions, as we ſee it happen.

Rains are not all equally favourable to the *Plants*, for the Diverſity of the Seaſons cauſes a very great Difference in their Qualities, and conſequently in the Effects they produce. For in *Autumn*, when the Sun begins to abandon our Hemiſphere, and to dart but obliquely its Rays in our Earth, the exalted ſaline Particles being deprived of that perfect Rarefaction, they uſed to undergo in the Summer Seaſon, fall, not quite diſengaged of the viſcous and tenacious *Vaſcules*, they were exalted with, diveſted of the greateſt Part of the Principles of Activity, they uſed then to communicate to the Earth, ſo that deſtitute of that Succour, and the Departure of the ſecond Agent, the Sun, renders it indolent, and almoſt inactive; but when by its entire Abſence, thoſe Corpuſcles return as cloſely wrapp'd up in their viſcous Capſulas, as when they were firſt exalted, then they make no Impreſſion on the Earth, not ſo much as to render it ſenſible of their Return. Though the Matrices continue working, and ſupply continually the vegetable Matter with new Recruits, but not in ſo great Abundance, as when aſſiſted in their Operation by thoſe foreign Succours, ſo that all that the vegetable Matter can do, is to ſupply the *Plant* with a Kind of Parcimony, with Aliments ſufficient to hinder the Diſſolution of its whole Mechaniſm, which would infallibly happen, if the organical Veſſels were deprived of a ſufficient Quantity of nutritive Juices, and which would occaſion a dangerous Contraction of their Membranes.

All *Botaniſts* are of Opinion that there is a certain Analogy between *Plants* and *Animals*; ſince *Plants* like *Animals* are compoſed of certain Parts, moved by a certain vegetative Spirit, and are poſſeſſed of a greater *Apparatus* of Organs, for the Performance of their vital Functions.

Two Things are to be carefully conſidered in *Plants*, *viz.* the ſenſible and organick Body; and the Spirit or the ſubtil and vegetative Body, which is the Cauſe of the whole Motion, and the Principle of all vital Functions.

This Spirit, or active Subſtance, which obtains the Name of *Soul* in living Bodies, is not even entirely excluded from Things deſtitute of Life; ſince the ſubtil Matter being carried, by a perpetual Motion, runs through the whole corporal Nature; but as it is too much diſperſed in the Bodies deprived of Life, nor can find in them Pipes and Receptacles, wherein it could be gathered in a greater Quantity thereby it could expel the Humours it ſhould meet with, and give a ſtronger Pulſation to the other Parts; it does not produce in them thoſe vital Motions of *Nutrition* and *Acretion*; hence *Foſſils* and other inanimated Bodies are of a longer Duration, becauſe not diſturbed, or worn out by that vegetative and active Subſtance. But in *Plants* and *Animals*, the active Spirit, continually agitated by the ſubtil Matter, runs, without Intermiſſion, throughout the whole Body; and the more or leſs 'tis agitated, it wants a greater or leſſer Quantity of Aliment, to avoid its feeding at laſt on the Subſtance of the living Body.

Plants conſiſt of ſeveral organical Parts, ſubſervient to this Motion, *viz.* of a *Root*, *Trunk*, *of Branches*, *Leaves*, &c.

The Root is the lower Part of the *Plant*, whereby it adheres to the Earth, whence, by the gentle, inward Heat of the Earth, the vertical Motion of the æthereal Subſtance, and the Fermentation, it receives its nutritive Juices, which is carried upwards, for its Preſervation. Therefore the *Root* muſt admit into its Compoſition, of a great Number of Pores, and Ducts, through which the Juices ſhould aſcend for the Nutrition of the *Plant*, ſince it cannot ſubſiſt without Aliment; for though ſome *Plants* have no

Branches, as Wheat, or no Fruits, as Jeſſamin; they nevertheleſs have all *Roots* to ſupply them with Aliments. This Aliment taken by the *Root*, as by a Mouth, is diſtributed through the open Pores and Ducts, to all the Parts of the *Plants*. *Boerhaave* conſiders the *Root* as compoſed of a Number of abſorbent Veſſels, analogous to the Lacteal in *Animals*, and M. *Reaumur* takes it to do the Office of all the Parts in the *Abdomen*, which miniſter to Nutrition; as the Stomach, Inteſtines, *&c.*

The Marrow, Bark, ligneous Body, and the *Trachæa*'s are part in the *Root*, which are equally diſtributed to the Trunk, and to the Branches; but, as we have already obſerved, the Marrow and the Bark have the ſame Origin; for in the lower Part of the *Root*, where the Bark is thicker, there is little or no Marrow; on the contrary, in its ſuperior Part, and in the Trunk, the Bark is thinner, and the Morrow in a greater Abundance.

Boerhaave obſerves, that the *Root* may have any Situation at Pleaſure, with reſpect to the Body of the *Plant*, nor needs to be either loweſt or higheſt. Accordingly in the Aloe, Coral, Moſſes, Fonguſes, *&c.* the *Root* is frequently uppermoſt, and its Growth downwards.

Roots are divided by *Botaniſts* into *Fibrous*, which ſend out only ſmall Strings from the Bottom of the *Plant*, diſtinct from each other. Such are thoſe of moſt Species of Graſs. Thick and groſs, on Account of their thick and groſs Body, either branched out into Subdiviſions, or elſe ſending out Fibres from it all along. Theſe laſt are either *carnous*, which again are either broad and ſwelling, or long and ſlender, which are commonly harder and more woody.

Broad and ſwelling *Roots* are either *Bulbous*, which conſiſt but of one Globe or Head, and ſend out Fibres from the Bottom; and are either *Squamous* and Scaly, as Lillies, Martagons, *&c. Coated*, which are involved in Skins, or Coats, as *Cepa*, *Hyacinthus*, *Allium*, &c. *Tuberous*, which are of a carnous, ſolid, and continued Conſiſtence; and theſe either, *Simple* with but one Globe or Head, as *Rapa*, *Crocus*, &c. *Manifold*, as *Aſphodelus*, *Pæonia*, &c.

Long *Roots* are either *Sarmentous*, i.e. twiggy or branching, which ſhoot or creep out tranſverſe, or in Breadth; of theſe ſome are geniculated, knotty or jointy; as Couch-Graſs, Mints, *&c. Cauliformes*, i.e. ſtemmy or ſtalky, which ſhoot down deep directly, though often ſending out Fibres and Strings from the great Stem; which, alſo, itſelf is ſometimes divided or branching.

As to the Trunk, called alſo, in Trees, the *Stem*, and which is that Part between the Ground and the Place, where it divides into Branches, is conſidered as the Body of the *Plant*, which transfers the Humour it receives from the Earth, through the *Roots* to the ſuperior Parts. Outwardly, 'tis covered with Bark, which is as a Skin to it; inwardly, it has Marrow, which, commonly, is called the Heart of a Tree, except when very ſoft, and fungous. As in the *Elder*. Between the Marrow and the Bark is placed what we call the *Ligneous Body*. And when ſeveral Stems, and of the ſame Equality riſe from the ſame *Roots*, they are called *Shrubs* or *Serments*.

Malpighi, in the Anatomy of *Plants*, diſtinguiſhes a double Order of Fibres, or Parts in the Trunk or Stem. 1. There are Fibres or ſmall Pipes collected into Bundles, protracted lengthways; then between them in an almoſt horizontal Manner is inſerted a certain Number of ſmall Buds or Bunches, which are ſomething like the Inſertions deſcribed by Dr. *Grew* in his Anatomy of *Plants*.

Beſides theſe *Fibres* and *Buds*, *Malpighi* has alſo found in the Trunk or Stem, larger Veſſels diſpoſed in Form of *Lamellæ*, or turned into a Spire, but the Parts they are compoſed of are ſo thin, that they might be depreſſed or dilated at Pleaſure; therefore he calls them *Trachæa* and *ſpiral Veſſels*. For he imagines that *Plants* have need of Reſpiration, and that the Air is carried with the Juice not only through the ligneous Fibres, but likewiſe throughout the ſpiral and ſpiratory Veſſels, and maintains no corporeal Subſtance can live, nor in the Earth, nor in the Water, without Reſpiration.

The Veſſels are common, perhaps, to all Sort of *Plants*; but each Kind has, beſides its proper Veſſels, appropriated to carry ſome particular Juice, or Aliment, which are apparent in ſeveral, whether they be filled with Turpentine, as the Terebinth; or with Milk, as in the lactiferous; or with Roſin, or other Liquor, which always ſeems more elaborate than that Juice contained in the ligneous Pipes or the Buds.

The *Marrow* is ſuppoſed to be of the ſame Uſe in *Plants*, as are the Heart and Brain in *Animals*; and *Malpighi* believes that the tranſverſe Diſpoſitions of *Buds* are deſigned for the ſame Uſe with the Marrow itſelf; for he conjectures that there is a crude Juice carried upwards through the ligneous Fibres, which gradually falls into the *Buds*, and the Marrow, where by a longer Stay, and the Fermentation, 'tis elaborated and perfected, to be ready at Hand for the Nutrition of the young Buds and Leaves at their Eruption.

The Branches of a Tree proceed from the Trunk, as the Members from the animal Body; and are of the ſame Nature with the Trunk; for they are likewiſe covered with Bark, have Marrow, and a ligneous Body. Often the Branches, riſe without Order, and, in Confuſion, from the Trunk, as in the *Elm*, *Oak*, and others; and ſometimes in an elegant Order, as in the Pitch and Firr-trees. The Branches which grew laſt, eſpecially when the Top is cut off, are called Scions; and thoſe which grow from the *Roots* of the talleſt Trees, unprofitable Branches.

Laſtly, Every Body knows that the Leaves, Flowers, and Seeds ſpring like new *Plants* from the principal or Maſter *Plant*. The Leaves themſelves have alſo their Caulicoles, in which the ligneous Pipes produced from the Trunk, and the Branches are aſſembled together with the Buds and *Trachæa*'s, and diſplayed in all the Parts of the Leaves to carry the nutritive Juice. Thus Flowers and Fruits receive their Nutrition from their Stocks; ſome of which are longer, ſome ſhorter; often the Seed is incloſed in the Fruit, in which lies hidden a *Plant* of the ſame Species.

From this Diſſertation we'll proceed to the Œconomy or Uſe of the Parts of *Plants*, with reſpect to their Nutrition and Increaſe.

The *Peripateticians* and *Gallenicks* define the nutritive Power, a Faculty of the vegetative Soul, by which it changes the Aliment into its Subſtance for its Preſervation. Hence its proper Function is called Nutrition, which is defined by them, a Converſion of the Aliment into the Subſtance of what's fed.

We ſuppoſe that Faculty to be nothing elſe but the vegetative Soul, or the active Subſtance, which being excited by the Heat of the Sun, as well as by that of the Earth, cauſes a Fermentation in the nutritive Juice, or which, perhaps, being taken by the vertical Motion of the æthereal Subſtance, brings up through the Pores of the *Roots*, appropriated to that Uſe, the vegetable Matter into the Trunk and Branches, and which by a Kind of Circulation, returns again to the inferior Parts. For the *Roots* of the *Plants* diſperſed in the Earth, produce certain Filaments, and ſmall Tubes, through which the Exhalations of the Earth, or rather the vegetable Subſtance, is forced, by the ambient Atmoſphere, into the Maſter *Roots*, whence it aſcends through the ligneous Fibres, as 'tis imagined, as far as the upper Extremity of the *Plant*. Then paſſes afterwards into the Buds, whence after it has been elaborated, and fermented a-new, 'tis diſtributed to every Part of the *Plant*, for the Nutrition and Increaſe of the whole vegetable Body; for it is impoſſible that a crude and undigeſted Juice could nouriſh the *Plant*; therefore when it aſcends upwards, if it happens that ſome Parts are more elaborated than others, they ſerve for the Nutrition of the upper Parts

of

of the *Plant*; and thoſe which are ſuperfluous, and more crude, after they have been prepar'd by a new Coction, in the Buds of the other Parts of the *Plants*, and even in the Marrow, they return to the inferior for their Nouriſhment likewiſe.

Therefore as the Blood, in Animals, flows through the Arteries, from the Heart to the Extremities, and returns through the Veins from the Extremities to the Heart; likewiſe the nutritive Juice in Plants aſcends from the Roots to the upper Parts, and deſcends back again, from the Top, or upper Parts, to the Roots. Which Doctrine is not mere Conjecture, ſince confirm'd by a vaſt Number of Experiments.

Botaniſts have not agreed among themſelves on the Manner this myſterious Motion, or rather Circulation, is accompliſh'd; and ſeem to be unacquainted, yet, with the Roads which the nutritive Juice follows in that Circulation; though it appears very probable, to ſeveral of them, that the moſt ſubtil Portion of the Aliment, being rais'd up by the vertical Motion of the æthereal Subſtance, is carried upwards, through the ligneous Fibres, the æthereal Subſtance being aſſiſted therein, by the Elaſticity of both the Air mix'd with the Juice, and of that contain'd in the *Trachæa's* and ſpiral Veſſels; and that the groſſer Parts are forc'd into the Buds, tranſverſly diſpos'd, and extended from the Bark to the Marrow; whence, after they have been mix'd, and fermented with what's left of the Suc, or rather the Leaven, they are carried back to the inferior Parts, for their Nutrition.

Therefore they imagine that the Air, as well that inclos'd in the *Trachæa's*, as that mix'd in the ligneous Fibres, in the nutritive Juice, (whether that Air exalted from the Earth aſcends into the Fibres and *Trachæa's*, or is brought in through the Pores of the Bark, together with the nitrous Spirits) they imagine, ſay I, that the Air, while rarify'd, by the diurnal Heat of the Sun, accelerate the Aſcent of the nutritive Juice; for if the Air contain'd in the *Trachæa's* be expanded by the Heat of the Sun, it preſſes the ligneous Fibres, and forces the nutritive Juice contain'd in them, on that Side, where there is leaſt Reſiſtance, *viz.* towards the upper Parts of the Plant; towards which Motion the Air mix'd with the Juice does not contribute a little. Whence we are to imagine a certain mechanical Structure of the Parts, in the ligneous Pipes, which can facilitate the Aſcent of the Juice, and render its Deſcent difficult; whether ſome ſmall Fibres be plac'd ſo as to have a Communication from the inferior Part of the Plant to the Top; or whether we imagine ſome other Diſpoſition of the Parts, which could ſupply the Place of Valvules in the Veins of Animals. Though 'tis inferr'd from a Branch of a Tree, planted upſide-down, ſhooting forth other Branches, that there are no Valvules in the ligneous Pipes; but no Body queſtions, at preſent, either the Reſpiration, or the Circulation of the nutritive Juices in the Plants. Therefore Plants have their Manner of Reſpiration, which I prove thus:

Thoſe Bodies have their Manner of Reſpiration, in which the Air has its Ingreſs and Regreſs. That the Air has its Ingreſs into the *Plant*, is evident, from what we have ſaid already, that it being dilated by the Heat of the Sun, and mix'd with the nutritive Juice, it aſcends the ligneous Fibres of the *Plants*, which it unfolds; and that it being receiv'd into the *Trachæa's*, it dilates them into a larger Volume, that they might preſs the ligneous Fibres, for the eaſier carrying upward the nutritive Juice. Which Air is expell'd from the Plant, by the Contraction of the ligneous Pipes, and ſpiral Veſſels; therefore Plants have their Manner of Reſpiration.

Likewiſe, there is a continual Circulation of the nutritive Juice through the whole Subſtance of the *Plant*, which is alſo prov'd in the following Manner:

There is a continual Circulation of the nutritive Juice, if that Juice, lifted up by the vertical Motion of the æthereal Subſtance, and by the Impulſion of the Air, is carried from the inferior Parts of the *Plant* to the ſuperior, and brought back, through the Buds, from the ſuperior to the inferior; which muſt be a true Suppoſition, ſince, 1. Such Circulation is common to all Sorts of living Bodies, which want Aliment, as well for their Nutrition, as to repair their exhauſted Subſtance. Since the Parts of the living Bodies can receive no Nouriſhment till that Portion of the Aliment, which is well elaborated, be ſeparated from what's crude and indigeſted, which muſt undergo another Coction; whence the Roots cannot receive any Nouriſhment from the indigeſted Juice, which they receive immediately from the Earth: Therefore a Juice, far better elaborated, muſt be brought back to them from the ſuperior Part of the *Plant*, for their Nouriſhment.

2. Some Trees die when they are diveſted of their Leaves, as it happens to Mulberry-trees, whoſe Leaves are often torn off to feed Silkworms, which ſeems to proceed from the Impoſſibility the nutritive Juice is then in of being percolated in the Leaves, and of being depurated from the crude Particles, that when carried back to the Roots, it might be a Food for them.

3. If the Vine be diveſted of its Leaves during the Summer, the Grapes are never brought to Maturity, becauſe depriv'd of the Juice which ſhould have been elaborated in the Leaves, and brought back to them for their Aliment.

4. When the lacteal *Plants* are ty'd in the Middle of the Stem, it ſwells above the *Ligature*, which could not happen, was not the nutritive Juice ſtopp'd by the *Ligature*, in its Deſcent from the upper Parts of the *Plant* to the Roots.

5. A curious Perſon ſelected once two Carpine Trees from a long Row of the ſame, whoſe Trunks adher'd to one another; he took the Pains to cut one of them croſs-wiſe, with a Saw, very near Half a Foot under the Coheſion, and inſerted a very ſmooth Stone between the divided Parts, to ſtop all Communication between them. The following Year he found that ſmall Branches had budded between the Coheſion and the Section, which young Branches muſt have receiv'd their Aliment from the Juice coming back from the upper Parts of the Tree, ſince they could be ſupplied from no where elſe.

Therefore it is plainly evident, that the nutritive Juice not only aſcends from the Roots to the upper Parts of the *Plants*, but likewiſe deſcends from the upper to the inferior Parts; and, conſequently, that both the *nutritive* and *augmentative* Faculties of the *Plants* are contain'd in that Motion. For the *augmentative Faculty* is defin'd, in the Schools, *Facultas animæ vegetantis, qua vivens, ſuſcepto intus alimento, & in ſuam ſubſtantiam converſo, ad debitam ſtaturam ſe promovet*; a Faculty of the vegetative Soul, whereby it lives, by taking inwardly the Aliment, and by changing it into its Subſtance, acquires its right Form and Proportions. Which Faculty we muſt not imagine, with the *Arabs*, as a certain Entity diſtinct from the Parts of the living Body, diſpos'd in a certain Manner to receive and contain the Aliment; ſince it is nothing elſe, either in *Plants*, or Animals, but thoſe Parts, ſo far as they contain the nutritive Juice, for the Explication and Extenſion of the living Body. Therefore that Faculty is improperly ſaid to change entirely the Aliment into the Subſtance of the *Plant*; ſince the Parts of the living Body are but *Patients*, and not *Agents*, while the nutritive Juice ferments in them.

But, however, there is a proper Function attributed to the *augmentative* Power, or Faculty, which is commonly call'd *Augmentation*, and defin'd in the Schools, *Operatio vitalis, per quam Corpus vivens, ſuſcepto intus alimento, eoque in ſuam ſubſtantiam converſo, ad debitam magnitudinem tendit*; a vital Operation, whereby the living Body takes the Aliment inwardly, and changes it into its Subſtance, to promote its Growth.

They diſtinguiſh this vital from the not vital Augmentation, in that the vital Augmentation proceeds from

from the inner Suſception of the Aliment, *i. e.* taking inwardly the Aliment, and diſtributing it, in a juſt Proportion, by means of ſome inner Pipes, or Ducts, to every Part of the Body, as it happens in Trees, Beaſts, and Men. As for the *Augmentation*, call'd *non vitalis*, or *not vital*, 'tis perform'd by *Juxta-poſition*, *i. e.* by the Poſition of the Parts of one Body, againſt the exterior Parts of another Body. In this Manner Stones are augmented, or grow in their Quarries.

Therefore *Plants* are augmented as often as they are ſupply'd with a greater Quantity of Corpuſcles of the nutritive Juice; whence thoſe Trees, whoſe Parts are harder, and have their Pores more compact, or leſs dilated, as the Oak, and Pine tree, are a great deal longer to be brought to Perfection, than thoſe which have their Parts ſofter, and their Pores more open; for ſome of theſe are preſently brought to Perfection, as the Poplar, *&c.* 'Tis for the ſame Reaſon that Trees don't grow, or at leaſt but very little, in Winter; for their Veſſels, Ducts, Pipes, *&c.* being contracted by Cold, and their Heat, or Ferment, greatly diminiſh'd, they receive, at that Time, little or no Nouriſhment; ſome *Botaniſts* being of Opinion, that the nutritive Juice is then congeal'd into the Conſiſtence of a Gum, and ſtagnated in the Veſſels; in which State it remains till the freſh Warmth of the ſucceeding Spring puts it in Motion again; upon which it renews its former Vigour, puſhes forth Branches, Leaves, *&c.*

Malpighi is alſo of Opinion, that the Motion of the nutritious Juices of *Plants* is produc'd much like that of the Blood in Animals, by the Action of the Air; and, with us, admits ſomething equivalent to Reſpiration throughout the whole *Plant*. He will have that by the Expulſion of the *Trachæa*, which he conſiders as Air-veſſels, and within which he pretends all the Series of arterial and venal Veſſels heretofore mention'd are contain'd; theſe Veſſels are preſs'd, and by that Means the Juice contain'd is continually propell'd, and accelerated; by which ſame Propulſion the Juice is continually comminuted, or render'd more and more ſubtil, and ſo enabled to enter Veſſels ſtill finer and finer; the thickeſt Part of it being, at the ſame Time, ſecreted, or depoſited into the lateral Cells, or *Loculi*, of the Bark, to defend the *Plants* from Cold, and other Injuries. The Juice having thus gone its Stage from the Roots to the remote Branches, and even the Flower; and having in every Part of its Progreſs depoſited ſomething both for Aliment and Defence; what is redundant paſſes out into the Bark, the Veſſels whereof are inoſculated with thoſe wherein the Sap mounted; and through this, it re-deſcends to the Root, and thence to the Earth again.

I cannot be of *Malpighi*'s Sentiment in this laſt Particular; for I do not believe that the vegetable Matter once uſher'd into the *Plant*, returns, after it has accompliſh'd its Circulation, into the Earth again: For though exhauſted of its moſt volatile Particles, in the Circulation, as well by its having ſupply'd the ſeveral Parts of the *Plants* with Food, for their Nutrition and Increaſe, as by Evaporation and Tranſpiration, the Reſidue is carried back to the Roots, by the ligneous Veins; for having been impregnated, in the Circulation, with the firſt Principle of Life, it retains yet a greater Degree of Perfection than the Matter uſher'd a new into the *Plant*; for then it is diſembarraſs'd, and purg'd of all thoſe *Fæces* and Impurities brought into the *Plant*, together with the new vegetable Matter; and therefore inſtead of returning into the Earth, 'tis rather probable, that when come back to the Roots, it is diſembogu'd into the Arteries through Inoſculation, which might be as reaſonably ſuppos'd to be at their inferior Extremities, as at their upper, between the Arteries and the Veins, (diſpos'd in ſuch a Manner, as to admit of the Ingreſs of the Reſidue of the vegetable Matter, and obſtruct the Egreſs of the freſh Aliment uſher'd into the *Plant*) that thereby mixing with the freſh Particles, it recovers its former Strength, and re-aſcend along with them into the *Plant*; to which Particles, this *Reſidue*, by its having been already impregnated with a more perfect Principle of Activity, than theirs can be expected to be, yet they are of a very great Uſe in aſſiſting them to eaſe themſelves, with a greater Facility, of their *Fæces* and Impurities; and, conſequently, I ſee no greater Likelihood for the vegetable Matter, after the whole Circulation is accompliſh'd, returning into its firſt Principle the Earth, than for our Blood returning after the Circulation into the Aliments, whence it has been extracted.

If it be objected, that if this Theory was true, there would happen, in Proceſs of Time, Repletion in the Veſſels; I'll anſwer, that this Accident is not to be fear'd more in the *Plant* than in the animal Body; ſince the nutritious Juices undergo, in Proportion, the ſame Changes and Mutations in the vegetable Body, as the Blood does in the animal Body, and what remains of them, after the Circulation, is ſo little, that it cannot produce *Phænomena* of that Kind. Beſides, Nature is ſo judicious in its Operations, that the more of that rarify'd Matter enters the Arteries, the leſs of the new Matter is uſher'd into them; ſo that when both are mix'd together, they make but a proportionable Quantity for a regular Circulation.

It is this *Reſidue* of the vegetable Matter, thus perfected, and inſpir'd with a new Principle of Activity, which helps towards uſhering a freſh Food into the *Plants*, aſſiſted therein by the Compreſſion of the Atmoſphere; for by the Activity of its Particles, it excites Fermentation in the new Maſs, whereby its moſt ſubtil Corpuſcles are exalted, with which mixing themſelves, they, in Concert, by their Elaſticity, begin their Courſe through the organical Veſſels, and hooking in the heavieſt, uſher them along with them; but as they would run the Riſque, through ſo long a Courſe, and charg'd with ſuch a Load, to fall back before they have half accompliſh'd their Period; the *Atmoſphere*, which environs the *Plant*, by the Rarefaction of the Corpuſcles 'tis compos'd of, ſends forth ſmall Columns, through the Pores of the *Plant*, of thoſe Corpuſcles, to accompany the vegetable Matter during the whole Circulation, by which 'tis either lifted up, or ſupported, as Occaſion requires. This is evident, by the different Changes happening in the vegetable Body, according to the Difference of the Seaſons; for in Summer, when the Rarefaction of the *Atmoſphere* is greater, by the Heat of the Sun being more intenſe and powerful, the Circulation is quicker; on the contrary, in Winter, when there is none, or very little Rarefaction of the *Atmoſphere*, through the Abſence of the Sun, the Circulation is ſo ſlow, as to be almoſt inſenſible. For if the *Atmoſphere* had no Part in the Circulation, and it depended only on ſome particular Vehicle, appointed by Nature, to the vegetable Matter; why ſhould that Circulation be ſubject to ſo great an Alteration, ſince there is no Vehicle to be met with in the Subſtance of the Earth, which is not as perfect and powerful in Winter, as it is in any other Seaſon. Water, for Example, which is eſteem'd by almoſt all *Botaniſts* the propereſt, is far more abundant in Winter, than in any other Seaſon; though at that Time *Plants* ſeem to be entirely deſtitute of Food.

Though *Plants* are almoſt all generated in the ſame Manner, and all compos'd of the ſame organick and other Parts, have all the ſame vegetable Matter for their Subſiſtence, *&c.* there is, nevertheleſs, the ſame Difference between them, as there is between Animals; ſince there is among them, as among theſe, a Diſtinction both of Sex and Species: And they are not only diſtinguiſh'd with regard to their Species, into *terreſtrial*, *aquatick*, *amphibious*, *annual*, *biſannual*, and *perennial*; but likewiſe into *male* and *female*.

All *Plants* which bear no Fruits or Seeds, and have only the Organ of Generation, are conſider'd as *Males*; and thoſe which bear Fruit, as *Females*. If we want to be inform'd what's meant by *Organ of Generation*, in a vegetable Body, which, by what we have obſerv'd

already, can be ſo eaſily generated, without ſuch an *Organ*; or if we believe that it is either a Folly, or impoſing on our too great Credulity, even to ſuppoſe the Exiſtence of ſuch Organ, with no other Deſign than to render, what's evident enough of it ſelf, more confus'd and incomprehenſible, ſome of our moſt famous *Botaniſts* are of a contrary Opinion, and pretend, that after the moſt curious Reſearches, and Obſervations, they have found, at laſt, that prolifick Organ in both *Sexes*. The ſole Difficulty remaining is, that they do not all agree on the Quiddity of that Organ; nor in what Manner both *Sexes* join in their Copulation. But to be better Judges of their different Sentiments on this curious Subject, we muſt previouſly obſerve, that the Flower of the *Plant*, both *male* and *female*, is ſuppos'd by them to contain thoſe Inſtruments of *Generation*, either in the *Piſtil*, or *Stamina*. That the *Piſtil* is a little upright Part in the Middle of the *Calix*, or the Leaves of Flowers, which ariſes from the *Pedicle* of the Flower, or the Center of the *Calix*, and at length become the young Fruit, which is ſometimes hid in the *Calix*, and ſometimes quite out; which *Piſtils* are not of the ſame Figure in all Flowers; for in ſome, the *Piſtil* is nothing but a little Stalk, which enlarges at the two Ends like a Peſtle; ſometimes 'tis a mere *Stamen*, or Thread; ſometimes it is round, ſometimes ſquare, triangular, oval, *&c.* though almoſt all *Piſtils* ſquare in this, that they are furniſh'd a-top, either with fine Hairs, which make a kind of *Velveting*, or with little Filaments diſpos'd in *Plumes*; or are beſet with little *Veſicles* full of a glutinous Juice.

Theſe *Piſtils*, whatever Form they be in, have certain Apertures at their Tops, or certain Clefts continu'd the whole Length, to the Baſe or Embryo of the Fruit. This is very viſible in the Lilly, Daffadil, and Melon, by cleaving the *Piſtils* length-wiſe, or cutting them tranſverſly. By opening the *Piſtils* in their different States of Growth, it appears evident, that they form the young Fruits, and contain within them the Embryo's of the *Seeds*; whether thoſe *Seeds* be diffus'd through the whole Length of the *Piſtil*, or whether they be all inclos'd in its Baſe; and that they are always open a-top, and perforated, either more or leſs, ſenſibly to the Bottom; though this Cavity is frequently effac'd, as the young Fruit grows; and ſometimes a Part of the *Piſtil*, which *Malpighi* calls the *Style*, or Bodkin, dries, and falls off.

This *Piſtil* is repreſented by all *Botaniſts*, (for in this they all agree) as the *Womb* of the *female Plant*; and this *Womb*, or *Matrix*, is divided by them into two Parts; the Baſe, which does the Office of the *Uterus* in Women; and the Length that of the *Vagina*.

This *Piſtil* is encompaſs'd with the *Stamina*, which are thoſe fine Threads, or Capillaments, growing up within the Flowers, call'd alſo *Chives*, on the Tops whereof grow thoſe little *Capſulæ*, or Knobs, call'd *Apices*; which M. *Tournefort* makes eſſential to the *Stamina*, though M. *Reaumur* is of a contrary Opinion, founded on his having diſcover'd no *Apices* on the Threads of the *Fucus marinus*; though he ſuppoſes, at the ſame Time, that the *Apices* fall as ſoon as the Threads, or *Stamina*, begin to be unfolded.

M. *Geoffrey* has made theſe Obſervations on the *Stamina*, that they are exceedingly ſhort in ſome tubular Flowers, as the *Narciſſus*, *Digitalis*, &c. and that in ſome others (as in the long *Ariſtolochia*, wherein the *Apices* are immediately faſten'd to the *Capſula*, which incloſes the Fruit) there are no *Stamina* at all. He further obſerves, that in ſeveral Flowers, as thoſe of Thiſtles, Lettuce, Chicory, *&c.* the *Apices* are inclos'd in the *Stamina*, ſeveral of which uniting, form a little Tube, in the Shape of a Scabbard, in the Inſide whereof are the *Apices*, with their *Farinæ*, the reſt of the Cavity being taken up by the *Piſtil*, which is a little Thread plac'd on the *Embryo* of the *Seed*.

Theſe *Stamina* are a kind of Stumbling-block to our *Botaniſts*, for they cannot agree among themſelves on their Uſe. M. *Tournefort* is of Opinion, that the *Stamen* is nothing elſe but an Aggregation, or Aſſemblage, as it were, of ſo many excretory Canals, for diſcharging the growing Embryo of its redundant Juices; and of the Excrements he takes that *Farina*, or Duſt, found in the *Apices*, to be formed. But Meſſ. *Geoffrey*, *Bradley*, and others, both antient and modern *Botaniſts*, maintain the Uſe of the *Stamina* to be to ſecrete, in their fine Capillary Canals, a Juice, which being collected, hardened, and formed into a *Farina*, or Duſt, in the Tips or *Apices*, is thence, when the *Plant* arrives at Maturity, diſcharged by the Burſting of the *Apices*, upon the Top of the *Piſtil*, whence is a Paſſage for it to deſcend into the *Uterus*, where being received, it impregnates and fecundifies the *Plant*. Whence it might be inferred that the ſame Flower contains both Sexes; which contribute both their Parts to the Generation: That the *Stamina* are the Male Part, and the *Farina*, which is always found of an oily glutinous Nature the ſeminal Liquor; the *Piſtil* being, as we have obſerved already, the Female Part, which conducts the *Semen* to the *Ova* or Embryo; which being thereby fecundated, is fed in the *Uterus* with a fine Juice, ſecreted by the *Petula*, grows, expands, and forms a new Fruit.

Thoſe Gentlemen pretend that the Diſpoſition of the *Piſtil*, and the *Apices* about it is always ſuch, as that the *Farina* may fall on its Orifice. That it is uſually lower than the *Apices*; and that when we obſerve it to be grown higher, we may conjecture the Fruit has begun to form itſelf, and has no farther Occaſion for the Male Duſt. That as ſoon as the Work of Generation is over, the Male Parts, together with the Leaves fall off, and the Tube leading to the *Uterus* begins to ſhrink, adding withal that the Top of the *Piſtil* is always covered with a Sort of Velvet Tunicle, or emits a gummy Liquor, the better to catch the Duſt of the *Apices*. *Laſtly*, That in Flowers that turn down, as the *Achanthus*, *Ciclamen*, and the *Imperial Crown*, the *Piſtil* is much longer than the *Stamen*; that the Duſt, or *Farina* may fall from their *Apices* in ſufficient Quantity on the *Piſtil*.

But what can be that *Farina*, ſo often mentioned already, for to have ſo prolifick a Virtue?

The FARINA is a fine Duſt, formed and ſecreted in the *Apices* or Tops of *Stamina*, where, when it becomes mature and copious enough, burſting its *Capſula*, it is ſpilt on the Head of the *Piſtil*, and when depoſited in the Utricle of the Female, draws the Nouriſhment from the other Parts of the *Plant* into the Rudiments of the Fruits, and makes them ſwell. The Reality of this Virtue, which Mr. *Bradley* calls magnetick, is argued from the ſame being found in Wax, which is chiefly or wholly gathered hence by the Bees.

The *Farinæ* are not of the ſame Size, Figure, and Colour in all Sorts of *Plants* indifferently; for ſome are tranſparent as cryſtal, as thoſe of the *Maple*, *Borrage*, and *Hemlock*; others are white, as thoſe of *Henbane* and *Balſamins*; others blue, as thoſe of *Flax*; others purple, as of ſome *Tulips*; others Fleſh-coloured, as ſome Species of *Lychnis*; and others red, as thoſe of the *Gum*. Even this is not an infallible Rule for the different Colours of *Farinæ*; for ſome vary in the ſame Species, according to the Colour of the Flower; and even ſometimes the *Farina* of the ſame Flower is of different Colours, as is eaſily obſerved in the *Caryophilus Arvenſis*.

The moſt general Figure of the *Farinæ* is the oval, more or leſs ſharp at the Ends, with one or more Channels or Furrows, running length-ways; ſo that through a Microſcope they look not unlike the Stone of a Date, as a Grain of *Wheat*, a *Coffee-Berry*, or an *Olive*; ſuch are thoſe of the *Polygonatum*, *Bugle*, *Briony*, *Tithimal*, *&c.* Thoſe of the *Melilot* are *Cylinders*; thoſe of the *Panſy* are Priſms, with four irregular Sides; thoſe of the great *Conſolida* repreſent two cryſtal Globules, cloſely faſtened to each other; thoſe of the *Sycamore* repreſent two Cylinders placed a-croſs; thoſe of the *Junquille* are in Form of a Kidney; thoſe of

of the *Campanula*, *Paſſion Flower*, &c. are nearly round, but unequal in their Surfaces; thoſe of the *Caryophillus Sylveſtris* are round, and cut in Faſcets; thoſe of the *Geranium*, and ſome other Species are round, with a Kind of Umbilicus, or Indenture, as in an *Apple*. Mr. *Bradley* ſays they are perforated quite through, like the Bead of a Necklace; thoſe of *Calika*, *Corona Solis*, &c. are little Globes, ſet with Prickles, *&c.*

Of theſe *Farinæ*, ſome are very hard, others ſoft, and eaſily broke. They all contain a deal of ſulphurous Matter, more than the other Parts; whence they are very odorous. Thoſe of the Lilly are ſo full of Oil, that they greaſe the Paper they are put upon, as if it had been oiled. The *Farinæ* of moſt aromatick *Plants* ſwim in an eſſential Oil, or Sort of liquid Turpentine; others are involved in a dry Reſin, as thoſe of the *Lycopodium*, or *Muſcus Terreſtris Clavatus*. Others, as thoſe of *Fumitary*, are incloſed in a little viſcid, mucilaginous Matter; and all in Effect have ſomething ſo glutinous, that they ſtick to any Thing that touches them, ſo that 'tis difficult to ſeperate them from each other. Some have imagined that the *Farinæ* were only Particles of Wax, or Reſin; but the contrary is eaſily proved; for they neither diſſolve in Water nor Spirit, nor Oils, even aſſiſted with Fire.

For the Manner wherein the *Farina* fecundifies, Mr. *Geoffrey* advances two Opinions. 1. That the *Farina* being of a ſulphurous Compoſition, and full of ſubtil penetrating Parts, (as appears from its ſprightly Odour) falling on the *Piſtils* of the Flowers, there reſolves, and the ſubtilleſt of its Parts penetrating the Subſtance of the Piſtil, and the young Fruit, excite a Fermentation ſufficient to open and unfold the young *Plant* incloſed in the Embryo of the Seed. In this Hypotheſis the Seed is ſuppoſed to contain the *Plant* in Miniature, and only to want a proper Juice to unfold its Parts, and make them grow. The 2d Opinion is, that the *Farina* is the firſt *Germ*, or Bud of the new *Plant*, and needs nothing to unfold it, and enable it to grow, but the Juice it finds prepared in the Embryo of the Seed.

This Author takes the proper Seed to be in the *Farina*, inaſmuch as the beſt Microſcopes do not diſcover the leaſt Appearance of any Bud in the little Embryo of the Grains, when examined before the *Apices* have ſhed their Duſt. He imagines in leguminous *Plants* if the Leaves and *Stamina* be removed, and the Piſtil, or that Part which becomes the Pod, be viewed with the Microſcope, ere yet the Flower be opened, the little green tranſparent *Veſiculæ*, which are to become the Grains, will appear in their natural Order; but ſtill ſhewing nothing elſe but the mere Coat or Skin of the Grain. That if the Obſervation be continued for ſeveral Days ſucceſſively, in other Flowers as they advance, the *Veſiculæ* will be found to ſwell, and by Degrees to become replete with limpid Liquor; wherein when the *Farina* comes to be ſhed, and the Leaves of the Flower to fall, we obſerve a little greeniſh Speck, or Globule, floating about at large. That there is not any Appearance, at firſt, of Organization in this little Body; but in Time, as it grows, we begin to diſtinguiſh two little Leaves like two Horns. That the Liquor diminiſhes inſenſibly, as the little Body grows, 'till at length the Grain becomes quite opake; when upon opening it, we find its Cavity filled with a young *Plant* in Miniature, conſiſting of a little *Germ*, or *Plumula*, a little *Root*, and the Lobes of the Bean or Pea. He ſuppoſes that, beſides that the Cavity of the *Piſtil* reaches from the Top to the Embryo's of the Grains, thoſe Grains or *Veſiculæ* have a little Aperture correſponding to the Extremity of the Cavity of the *Piſtil*, and that it is through this Aperture the *Farina* falls in the Mouth of the *Veſicula*, which is the Embryo of the Grain. That this Cavity or Cicatricula, is much the ſame in moſt Grains, and is eaſily obſerved in *Peaſe*, *Beans*, &c. without the Microſcope. The *Root* of the little *Germ* being juſt againſt the Aperture, thro' which it paſſes out when the little Grain comes to germinate.

This Syſtem ſeems well enough adapted to thoſe *Plants* called *Hermaphrodites*, and which have both Male and Female Parts, *i. e.* the *Farina*, and *Piſtil*; but it is not ſo eaſily reconciled to a Species of *Plants* which bears Flowers without Fruits, and therefore diſtinguiſhed into Male and Female; of which Kind are the *Palm-Tree*, *Poplar*, *Hemp*, *Hops*, &c. For how ſhould the *Farina* of the Male, here, come to impregnate the Seed of the Female? Mr. *Geoffrey* is pleaſed to anſwer, that the Wind, doing the Office of a Vehicle, brings the *Farina* of the Males to the Females. I muſt confeſs that Mr. *Geoffrey* does a great deal of Honour to the Wind, to inveſt it with ſo much Knowledge, Prudence, and Diſcretion; for to effect this, it muſt know when that Tranſmigration is moſt proper to be made; as when the *Farina* is diſpoſed for Copulation; it muſt know likewiſe the Difference of the Sexes of the *Plants*, and the different Species of thoſe Sexes, leſt he ſhould make ſome Miſtake, and carry the *Farina* of one Species to the Piſtil of another Species, and by ſuch Miſtake occaſion the Production of Monſters in the vegetable World. It muſt know likewiſe the Situation of both Sexes, for both Sexes in the vegetable Race, are as often aſunder, as in the human Race; and Divorce and Separation are as frequent among them as among us, nay the Female *Plants* go as often a Whoring as Wives, and what's the moſt monſtrous, are often found in the ſame Bed with the Male of another Species; therefore the Wind muſt know all theſe Tricks before it can be ſuppoſed qualified for a faithful *Mercury*, unleſs they be all as dexterous as that mentioned by *Jovinianus Pontanus*, which, ſenſible of a poor Female Palm-Tree, which had lived in a State of Celibacy in the Wood of *Otrant*, very much againſt her Will, as might be ſuppoſed, brought her at laſt, that precious Jewel, the Inſtrument of Generation of a Male Palm-Tree, cultivated at *Brendiſi*, 15 Leagues diſtant from *Otranto:* What's the more ſurpriſing to me is, that Mr. *Geoffrey* ſeems to believe that monſtrous Romance, and to make Uſe of it to ſupport his Syſtem.

M. *Tournefort*, ſenſible, as I ſuppoſe, of the Ridicule of it, imagines, that without that myſterious *Farina*, the fine *Filaments*, *Tormentum*, or *Down*, always found on the Fruits of the *Plants*, may do the Office of Impregnation.

When I reflect ſeriouſly on theſe different Sentiments, which in other Men would be conſidered as a Piece of the greateſt Extravagancy and Folly, and deſerving, at leaſt, *Bedlam*, or the *Petites Maiſons*; I cannot but admire the ridiculous Vanity of Mankind, in attempting not only to penetrate into the inmoſt Secrets of Nature itſelf, but even to force her to act contrary to thoſe irrevocable Orders and Regulations, eſtabliſhed from the Beginning by the Author of all Things: Why ſhould we ſearch the Principles of Generation in Vegetables any where elſe but where they are to be found? Why ſhould we have the Barbarity to lead our Fellow-Creatures through ſo many intricate and difficult Paſſes, to attain to an End, which, with the leaſt Reflection, is ſo eaſily obtained? Why ſhould we make a Diſtinction of Sexes in the *Plants*, where there is none? To what End? For the Generation of the *Plants*; have they not that Principle of Generation within themſelves, from that very Moment the Crearor commanded the Earth *to bring forth Graſs, the Herb yielding Seed, and the Fruit-Tree yielding Fruit after its Kind, whoſe Seed is in itſelf upon the Earth.* Gen. i. 11. Is not this better underſtood, and more agreeable to Reaſon, than to have Recourſe to Impoſſibilities for the Generation of *Plants*? Is it not more evident, and eaſier to be demonſtrated, that the Seed has in itſelf the firſt Principle of the vegetable Life, which lay dormant in the Seed, 'till by its being put into the Earth, and excited by Fermentation, they become active, and apply themſelves to the admirable Mechaniſm of the *Plant*, on which they work without Intermiſſion, 'till they have brought it

to

to its Perfection, or are forced to desist, by meeting with some insuperable Obstacles; than to say, that an insignificant Excrement of the *Plant*, which we are pleased to dignify with some particular Title, and whose Effects we explain by some problematick Terms, which we do not so much as understand ourselves, has that Faculty of fecundating the Seed? The Difference of Sentiments in *Botanists* on that Subject, and even of the most learned among them, is sufficient to convince us, that they speak of a Thing which they know nothing of themselves; and that they would, if they could, render problematick, what's apparent enough of itself; for in Fact the Seed, without the Concurrence of any other Causes, has its Fecundity in itself, which wants no other Assistance, for to unfold its first Principles, than of a Fermentation in the Earth, or in some other Place, fit to excite its Activity.

From this difficult Point we'll proceed to the other Distinction we have made of *Plants*; into *Terrestrial*, which are those that live only on Land, as *Oak*, *Beech*, *&c.* *Aquatick*, which live either in Rivers, as the *Water-Lilly*, *Water-Plantin*, &c. or in the Sea, as the *Fucus*, *Coral*, *Coralline*, &c. *Amphibious*, which live indifferently either in Land or Water, as the *Willow*, *Alder*, *Mints*, &c. *Annual*, which are those, whose *Root* is formed and dies the same Year, such are the leguminous *Plants*, *Wheat*, *Rye*, &c. *Bisannuals*, which only produce Flowers and Seeds the second, or even third Year after their being raised, and then die; such are *Fennel*, *Mint*, &c. *Perennial*, which never die after they have once born Seed. Of those, some are Ever-greens, as the *Asarabacca*, *Violet*, &c. others loose their Leaves one Part of the Year, as *Fern*, *Coltsfoot*, &c. *Note*, That this Distinction is not made with Regard to their Species, but only to their Age and Period.

Plants are also distinguished, with regard to their Magnitude, into Trees, Shrubs, and Herbs. *Trees*, are the *Oak*, *Pine*, *Fir*, *Elm*, *Sycamore*, &c. *Shrubs*, are the *Holly*, *Box*, *Ivy*, *Juniper*, &c. And *Herbs*, are *Mint*, *Sage*, *Sorrel*, *Thyme*, &c.

Mr. *Ray* distinguishes the Trees and Shrubs of *English* Growth into *nuciferous Trees*, which are those which have their Flower disjoined and remote from the Fruit, or bears Nuts; as the *Walnut-Tree*, the *Hazle-Nut-Tree*, the *Beech*, the *Chesnut*, and the common *Oak*. *Coniferous*, or such as bear a squammous or scaly Fruit, of a conical Figure, and a woody or hard Substance, in which are many Seeds; which, when they are ripe, the Cone opens or gapes in all its several Cells or Partitions, and lets them drop out. Of this Kind are the *Scotch* Firs, Male and Female; the Pine which in our Gardens is called the *Scotch Fir*, the common *Alder Tree* and the *Birch-Tree*. *Bacciferous*, or such as bear Berries, *i. e.* Fruit covered with a thin Membrane, wherein is contained a Pulp, which grows soft, and moist when ripe, and encloses the Seed within its Substance, which Trees Mr. *Ray* divides into four Kinds. 1. Such as bear a Caliculate, or naked Berry; the Flower and Calix both falling off together, and leaving the Berry bare, as the *Sassafras-Tree*. 2. Such as have a monopynereous Fruit, that is, containing in it only one Seed, as the *Arbutus*, *Terebinthus*, *Lentiscus*, &c. 3. Such as have a naked but polypyreneous Fruit, that is, containing two or more Kernels or Seeds within it, as the *Jasminum*, *Ligustrum*, &c. 4. Such as have their Fruit composed of many Acini, or round soft Balls set close together like a Bunch of Grapes, as the *Uva Marina*, *Rubus vulgaris*, *Rubusidæus*, and the *Rubus minor fructu Cæruleo*.

There are, also, *lanigerous Trees*, or such as bear a woolly, downy Substance; as the black, white, and trembling Poplar, Willows, and Osiers of all Kinds. *Trees* that bear their Seeds (having an imperfect Flower) in leafy Membranes and Cases, as the Hornbeam, or Hardbeam, call'd in some Places the Hornbeech. Such as have their Fruits and Flowers contiguous, which are either with the Flower plac'd on the Top of the Fruit, or adhering to the Base, or Bottom of the Fruit. Of the former Kind, some are pomiferous, as Apples and Pears; and some bacciferous, as the Sorb, or Service Tree, the White, or Haw-thorn, the Wild Rose, Sweet-brier, Currants, the Great Bilberry-bush, Honey-suckle, Ivy, &c. The latter Kind are either such as have their Fruit soft, and moist, when ripe; as, 1. *Pruniferous* ones, whose Fruit is pretty large and soft, with a Stone in the Middle, as the Black-thorn, or Sloe-tree, the Black and White Bullace-tree, the common wild Cherry, the Black Cherry, *&c.* 2. *Bacciferous Trees*, as the Strawberry tree in the West of *Ireland*, Mistletoe, Water-Elder, the Dwarf or large Laurel, the *Viburnum*, or Way-faring Tree, the Dog-berry Tree, the Sea Black-thorn, the Berry-bearing Elder, the Privet, Barberry, Common Bramble, and the Spindle-tree, or Prick-wood.

Also such as have their Fruit dry, when ripe; as the Bladder-nut Tree, the Box-tree, the Common Elm, and Ash, the Maple, the Gaule, or Sweet Willow, Common Heath-broom, Dyer's Weed, Furze, or Gorse, and Lime-tree.

Shrubs, are nothing else but little, low Dwarf-trees, or woody *Plants*, of a Size less than a Tree; and which, besides their principal Stems and Branches, frequently from the same Root put forth several other considerable Sets, or Stems. Such are the Privet, Phyllirea, Holly, Box, Honey-suckle, *&c.* *Shrubs* are distinguish'd, by some, from *Sufrutices*, or *Under Shrubs*, which are low Bushes, that do not put forth, in Autumn, like *Trees* and *Shrubs*, a Kind of Buttons, or Gems, in the Axis of the Leaves; such are Lavender, Rue, Sage, *&c.*

Botanists divide, likewise, the Vegetable World into *Genera* and *Species*; though they do not all agree upon, from what Consideration the Division into *Genera* is best taken. *Tournefort*, one of the latest and best Writers, after a long and accurate Discussion, has chose, in Imitation of *Gesner* and *Columna*, to regulate them by the Flowers and Fruit consider'd together; so that all *Plants* which bear a Resemblance in those two Respects, are of the same *Genus*, (*i. e.* that they all agree in some one common Character, in Respect of the Structure of certain Parts, whereby they are distinguish'd from all other *Plants*) after which, the respective Differences, as to Root, Stem, or Leaves, make the different Species or Subdivisions. He pretends, contrary to Mr. *Ray*'s Opinion, that he has never hitherto met but with fourteen different Figures of Flowers, which are to regulate entirely the *Genus* or Class of *Plants*, and which is all that's to be retain'd in the Memory, to be capable to descend to six hundred and seventy-three *Genera*, which comprehend 8846 Species of *Plants*; which is the Number of those yet known by Land and Sea.

Since M. *Tournefort* is of Opinion that the different Figures of Flowers are to regulate entirely the *Genera*, or Classes of *Plants*; it will not be improper to examine, in this Place, and previously to the Distinction of *Plants* made by Mr. *Ray*, not only those different Figures of Flowers, but also inform our selves, in a more particular Manner than we have done yet, of the Structure of those Flowers, and first of the Definition of Flowers.

Flower, is defin'd, by *Botanists*, that Part of a *Plant* which contains the Organs of *Generation*, or the Parts necessary for the Propagation of the Kind.

Dr. *Grew* divides the *Flower* into three Parts, which are the *Empalement*, *Foliation*, and *Attire*.

He calls *Empalement*, or *Calix*, the outer Part of the *Flower*, which environs the two others, which is either of a whole Piece, or continu'd; as in Pinks and Carnations; or divided into several, as in Roses. When divided, it resembles small Leonies, as it appears in the *Flowers* of the Quince-tree, or of Primroses. The *Empalement*, or *Calix* of *Flowers*, is compos'd of the same essential Parts which form the *Plant*, *viz.* of the Skin, or *Cortex*, *Parenchyma*, and *ligneous* Body; as is evident in the *Artichoke*, which is but a *Flower*, of which, what's vulgarly call'd the

Leaves, are the *Empalement*, or *Calix*. It even appears that the Skin which covers thoſe *Leaves* are all of a Piece, from the inner, which are leſſer, to the outer *Leaves*, which are the greater; ſo that what we take to be different *Leaves*, is only the ſame *Empalement*, or *Calix*, which has ſeveral *Plits*.

The Uſe of the *Calix* is, to ſupport and cover the other Parts of the Flowers; it covers them while they are yet in Buds, and thereby defends them againſt the Injuries of an exceſſive Cold, or of an extreme Heat; and ſupports them in ſuch a Manner, as to keep them always in the moſt advantagious Situation. 'Tis for this Reaſon that *Empalements*, or *Calices*, are different, and more or leſs ſtrong, according to the Diverſity of Flowers. There are ſome Flowers which have no *Empalement*, or *Calix*, as Tulips; becauſe their Leaves being thick and ſtrong, and each reſting on its proper Baſis, they want no *Calix* for their Support. On the contrary, Carnations and Pinks have a *Calix*, which, to be ſtronger, is all of a Piece; otherwiſe their Leaves, whoſe Foot is very long and ſlim, would part from each other, and deviate from their natural Situation, or Place. This *Calix* is *dentated* atop, that it may the eaſier ſhut, and cover the Leaves, while yet too tender; and afterwards open, and ſpread it ſelf a little under the ſame Leaves, to ſupport them, when the Flower is entirely blown. Laſtly, There are Flowers whoſe Leaves being very long, and very tender, have *Calices* compos'd of ſeveral Pieces, the one plac'd above the other, almoſt like the Scales of a Fiſh, being thereby more proper to ſupport and preſerve thoſe Flowers; as is plainly ſeen in *Jacees*, and other like Flowers.

The Leaves of the Flower are alſo compos'd of the ſame eſſential Parts with the green Leaves; for their Membranes, Pulps, and Fibres, are nothing elſe but the Skin, *Parenchyma*, and *Ligneous* Body, which have ſpread to form them.

The Leaves of the Flowers, like the green Leaves, have ſeveral different Diſpoſitions; among which, the following ones are the moſt common: In Roſes, and ſeveral other double Flowers, the Leaves are only a little leaning upon one another, and ſtill more in the Flowers of *Blattaria*. Sometimes they are folded in, as are ſome Leaves of the Flowers of Peaſe, and the Leaves of Coriander-flowers; and thoſe *Plits* are as ſimple as in theſe here mention'd; or double, as in the *Jacees*, &c.

There are Flowers whoſe Leaves are at the ſame Time folded, and leaning over one another; as the *Marigold*, *Daiſies*, and other like Flowers; for when they begin to open, their Leaves are ſeen leaning over one another; and when thoſe Leaves are grown bigger, 'tis eaſily diſcover'd that each make two *Plits*. There are Flowers whoſe Leaves are roll'd up; for Example, in thoſe of *Clematis*, the Top of the Leaves are roll'd in. In ſome others, the Leaves form a kind of Vyce, or ſpiral Line; as the Flowers of Mallow, and others. Laſtly, Some are plitted, which, notwithſtanding, are diſpos'd into Spirals, becauſe the whole Body of thoſe Flowers being all of a Piece, there are only Plits which reign in a ſpiral Line, from the Top to the Bottom.

It is eaſily underſtood why there are ſo many different Diſpoſitions in *Flowers*; for the Bigneſs and Figure of their Leaves are ſo unequal, that it is impoſſible they ſhould be otherwiſe diſpos'd. Dr. *Grew* ſays, that he has never ſeen the Leaves of Flowers roll'd outward, as are ſometimes the green Leaves; and gives for Reaſon of this Difference between both, 1. That the Fibres are not rais'd on the Back of the Leaves of the Flowers, as they are on the Back of other Leaves. And, 2. Becauſe the Leaves of the Flowers ſerve to ſhut up, and preſerve the *Heart*, which they could not do, if they were roll'd outward.

Beſides the green Leaves, and *Empalement*, or *Calix*, which ſerve as *Wrappers* to Flowers; ſome have other Parts to defend them againſt the Injuries of the Air, as the Spring-Saffron; for its Flowers having no *Calix*, and coming out of the Earth before the green Leaves, *i. e.* at the very Beginning of the Spring, Nature has ſupply'd them with a double Veil, to ſhelter them.

There are various *Flowers* in which the Baſis of the Leaves is cover'd with a kind of Down, which fills up the whole Extent of the *Calix*, that thereby thoſe Leaves which are very tender might be kept always in a moderate Warmth neceſſary to them; and though the Leaves themſelves be not cover'd with thoſe ſmall Hairs, however, there are ſome, which, in ſome Places, feel like Sattin, or very ſoft Velvet; becauſe thoſe Places being contiguous to the Heart of the Flower, which is very tender, and touching it often, they muſt be ſoft, and warm, to preſerve it. 'Tis for this Reaſon that in the Flowers of *Clematis* thoſe Parts of the Leaves which are roll'd in, and contiguous to the Heart, are like Velvet, while the other Parts are even, and ſhine as if they were glaz'd. The ſame Thing is obſerv'd in the Flowers of Peaſe, Hemp, and the like; for the Leaves contiguous to the Heart of thoſe Flowers, are always a little like Velvet.

The Leaves ſerve to cover the Heart of the Flower, and the Fruit; ſo that as the *Calix*, being harder, and coarſer, is their outer *Envelope*; the Leaves being tenderer, is the inner one, and both of an equal Utility.

The different Situation of theſe Leaves, and of the Fruit, in various *Plants*, evidences this Truth; for Apples, Pears, and other Fruits, whoſe *Parenchyma*, or Pulp, have a competent Solidity, are ſituated behind, or above the Flowers; whereas Cherries, Apricots, and other like Fruits, are ſhut within the Flowers; becauſe beginning to be form'd in the Beginning of the Spring, which is often pretty cold, and their *Parenchyma*, or Pulp, being very tender, they would infallibly periſh, if they were not wrapp'd up in the Flowers which preſerve them. But the Preſervation of the Fruit is not the only Uſe of the Flowers; for they contribute, beſides, towards making it grow, while yet but in Embryo; and 'tis for this Reaſon that Flowers are more or leſs large in Proportion, as the Fruit requires more or leſs Juice for its Nutrition. For unleſs a young Fruit was of a Conſiſtence ſolid enough, as Apples, Pears, *&c.* the Suc could not enter it abundantly enough, if the Flower, which is above, was not to contribute towards it, in the ſame Manner the green Leaves contribute to the Aſcent of the Juices into the Branches; ſo that the young Fruit would die, or at leaſt never be brought to Maturity, or Perfection. On the contrary, if the Flowers were too large, in Proportion to the Fruit, they would exhauſt and intercept all the Juices. Therefore the Pulp of Quinces being more ſolid than that of Apples or Pears, their Flowers are alſo larger, and even the *Calices* of thoſe Flowers grow, and remain green long after the Flowers are fallen, till the Fruit has no longer Need of them.

The Prune, whoſe Pulp is tenderer than thoſe of Apples or Pears, have their Flowers ſmaller, though their *Calices* are as large. The Gooſeberry and Currant, whoſe Pulp is tender, have likewiſe their *Flowers* ſmaller yet: And, laſtly, the Pulp of Currants being the tendereſt of all, and nouriſh'd with a Juice more volatile than the others, and which, conſequently, aſcends with more Eaſe, or Facility, the Vine which bears them produces no *Flowers*, but only ſome ſmall Parts which ſupply the Place of *Flowers*, and which falls off as ſoon as the Fruit is form'd.

Mr. *Ray* divides *Flowers* into *perfect* and *imperfect*, and ſubdivides the *perfect* (which, in his Opinion, are all thoſe which have the *Petala*, though they want the *Stamina*) into *ſimple* and *compounded*. The *ſimple* are thoſe which are not compos'd of other ſmall ones, and, uſually, have but one ſingle Style; and the *compounded* have many *Foſculi*, all making but one *Flower*.

Single Flowers are either *monopetalous*, or *polypetalous*. The *monopetalous* have the Body of the *Flower* all of an entire Leaf, though ſometimes cut, or divi-

ded a little Way, into many ſeeming *Petala's*, or *Leaves*; as in Burrage, Bugloſs, *&c.* The *polypetalous* are thoſe which have diſtinct *Petala*, and thoſe falling off ſingly, and not altogether; as the ſeeming *Petala* of the *monopetalous Flowers* always do.

Both theſe are further divided into *uniform* and *difform Flowers*. The *uniform* have their Right and Left Hand Parts, and the forward and backward Parts, all alike. But the *difform* have no ſuch Regularity; as in the *Flowers* of Sage, Dead-nettle, *&c.*

Note, That PETALA are the colour'd Leaves of a *Flower*.

Monopetalous difform Flowers are, likewiſe, further divided into *ſemi fiſtular*, *labiate*, and *corniculate Flowers*. The *ſemi-fiſtular Flowers* are thoſe whoſe upper Parts reſemble a Pipe cut off obliquely; as in the *Ariſtolochia*. The *labiate*, thoſe either with one Lip only, as in the *Acanthium* and *Scordium*; or with two Lips, as in the far greater Part of the *labiate Flowers*. And here the upper Lip is ſometimes turn'd upwards, and ſo turns the convex Part downward; as in the *Chamæciſſus*, &c. but moſt uſually the upper Lip is convex above, and turns the hollow Part down to its Fellow below, and ſo repreſents a kind of Helmet, or Monk's Hood; ſuch are the *Flowers* of the *Lamium*, and moſt *verticillate Plants*. Sometimes, alſo, the *Labium* is entire; and ſometimes jagged and divided. The *corniculate* are thoſe hollow *Flowers* which have on their upper Part a kind of Spur, or little Horn; as in the *Linaria*, *Delphinum*, &c. and the *Corniculum*, or *Calcar*, is always impervious at the Tip, or Point.

Compound Flowers, are either *diſcous*, *planifolicus*, or *fiſtular*. The *diſcous*, or *diſcoidal*, are thoſe whoſe *Floſculi* are ſet together ſo cloſe, thick, and even, as to make the Surface of the *Flower* plain and flat; which therefore, becauſe of its round Form, will be like a *Diſcus*, which is ſometimes radiated, when there is a Row of *Petala* ſtanding round in the Diſk, like the Points of a Star; as in the *Matricaria*, *Chamæmelum*, &c. and ſometimes naked, having no ſuch radiating Leaves round the Limb of its Diſk; as in the *Tanacetum*. The *planifolious* are thoſe compos'd of plain *Flowers*, ſet together in circular Rows round the Center, and whoſe Face is uſually indented, notch'd, uneven, and jagged; as the *Hieracbia*, *Sonchi*, &c. The *fiſtular* are thoſe which are compos'd of many long, hollow, little *Flowers*, like Pipes, all divided into large Jags at the Ends.

Imperfect Flowers are ſuch as want the *Petala*, and are call'd, likewiſe, *ſtamineous*, *apetalous*, and *capillaceous Flowers*. *Tournefort* calls *amentacious* thoſe *Flowers* which hang pendulouſly by fine Threads, like the *Juli*; we call them *Cat's tails*.

The other Diviſions of *Flowers* are into *campaniform*, *cruciform*, *infundibuliform*, *cucurbitaceous*, *ſtamineous*, *leguminous*, *papilionaceous*, *umbelliform*, and *verticallate Flowers*. The *campaniform* are thoſe in Shape of a Bell. *Cruciform*, thoſe conſiſting of four *Petala*, or *Leaves*, the *Calix*, alſo, containing four *Leaves*; and the Piſtil always producing a Fruit: Such are thoſe of the Clove-tree, Cabbage-tree, *&c.* *Infundibuliform*, are ſuch as reſemble the Figure of a Funnel, *i. e.* are broad and ample a top, and contracted into a Neck at Bottom: Such is that of the Bear's Ear. *Cucurbitaceous* are ſuch as reſemble the *Flower* of the Gourd, or have the ſame Conformation therewith. *Stamineous* are ſuch as have no *Petala*, but conſiſt wholly of *Stamina*, or Threads, with *Apices* a-top. The *Leaves* plac'd round theſe *Stamina*, are not to be eſteem'd as *Petala*, but a *Calix*, in regard they afterwards become a *Capſula*, or Cover, including the Seed; which is the Office of the *Calix* alone. The *leguminous* are thoſe of *leguminous Plants*; they bear ſome Reſemblance to a flying Butterfly; for which Reaſon they are alſo call'd *papilionaceous*, which conſiſt of four or five *Leaves*, whereof the uppermoſt is call'd *Vexillum*, or Standard; and the loweſt *Carina*, as reſembling the Bottom, or Keel of a Boat: Thoſe between the two are call'd *lateral Leaves*, or *Alæ*; from the Bottom of the *Calix* ariſes a Piſtil, which is encompaſs'd with a Sheath, or Cover, fring'd with *Stamina*; this Piſtil always becomes the Fruit, and is uſually call'd the Pod, in *Latin Siliqua*. *Umbelliform*, are thoſe with ſeveral *Leaves* double, and diſpos'd in manner of a Roſe, and whoſe *Calix* eſſentially becomes a Fruit of two *Seeds*, join'd before they come to Maturity; but afterwards eaſily ſeparated again. They are thus call'd, becauſe they are uſually ſuſtain'd by a Number of Threads, which proceeding from the ſame Center, are branch'd all round, like the Sticks of an *Umbrello*; of this Kind are the *Flowers* of *Fennel*, *Angelica*, &c. And the *verticillate* are thoſe rang'd, as it were, in Stories, Rings, or Rays, along the Stems; ſuch are thoſe of Horehound, Clary, *&c.*

From the *Flowers* we'll paſs to the *Fruits*, which are compos'd of the ſame eſſential Parts deſcrib'd already in the other Parts of the *Plants*; that is to ſay, of the Skins, or Membranes; of the Pulps, or *Parenchyma*; and of the *Fibres*, or *ligneous Body*. However, as the various Diſpoſitions and Preparations of thoſe Parts make a very great Quantity of different Fruits, Dr. *Grew* contents himſelf with deſcribing the moſt common, and principal, to which all others might be reduc'd; which are Apples, Pears, Prunes, Filberds, and Blackberries.

Apples are compos'd of four Parts, which are the Skin, the Pulp, the *Fibres*, and the *Capſula*, which contain the *Seed*. The Skin is but a Continuation of that of the Branch extended as far as the *Fruit*. The *Pulp* is likewiſe nothing elſe but the *Parenchyma* of the *Tree*, which extends it ſelf, and ſwells, which appears manifeſtly, when we examine an Apple, yet very ſmall, and newly form'd; and that Pulp, hard, and of a coarſe Juice, at firſt, becomes, in Proceſs of Time, tender, delicate, and grateful to the Taſte, the ſame as the Marrow, which is commonly pretty hard, and of an acerb Taſte, becomes tender and ſweet in ſome Roots, as in Parſnips, Turnips, Carrots, and others.

The *Fibres* are but the *Ramifications* of the *ligneous* Body, which penetrate the *Parenchyma*, and whoſe bigger joins together, as in the *Leaves*, by the interwoving of the ſmaller. There are commonly in Apples fifteen large *Fibres*, ten of which are diſtributed throughout the whole Subſtance of the Pulp, and at laſt join together towards the *Umbillic*, or the Eye of the Apple; and the five others paſs in a right Line through the *Pedicle*, as far as the ſaid Eye of the Apple, where meeting with the firſt ten, they mix, and unite with them: Theſe laſt five have their Origin from a ſingle one, which having extended it ſelf all along the *Center* of the *Pedicle*, and even in one Part of the Pulp, is divided, at laſt, into five Branches, to which are ty'd the *Kernels* of the Apple. Therefore though originally thoſe *Fibres* croſs in a right Line the whole Pulp of the *Fruit*, and penetrate as far as to the *Flower*, to which they carry the Sap which makes it grow; nevertheleſs, in Proceſs of Time, the *Fruit*, which grows bigger, drawing to it ſelf all the Juice which paſſes in thoſe *Fibres*, the *Flower* withers, and falls, and thoſe five *Fibres* are no longer of Uſe, but to the *Fruit*. Whence it may be concluded, that of the fifteen large *Fibres* diſcernible in the Apple, ten ſerve to carry the Sap into the Pulp, or *Parenchyma*; and five are deſtin'd for the Nutrition of the *Kernel* or *Seed*.

The *Capſula* proceeds from the Marrow; for as ſoon as the Pulp begins to grow big, the Juice, finding Room enough, enters into it, and quits the Marrow, which withers, and thus forms the *Capſula*.

Pears are compos'd of five Parts, which are the Skin, or *Cortex*, *Parenchyma*, Ramification, Stone, and *Acetarium*. The three firſt are very near like thoſe of Apples, with this ſingle Difference, that the *Fibres*

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Fibres which run in a right Line in the *Pear*, and ſerve for the Nutrition of the *Kernels*, are in greater Number; for commonly there are found ten.

The *Stone* obſerv'd chiefly in choaky Pears, is not an eſſential and vital Part like the others, but is only a Congeries of ſtony Corpuſcles, diſpers'd throughout the whole *Parenchyma*, but in the greateſt Plenty, and cloſeſt together, about the *Center*, or *Acetarium*. It is form'd of the ſtony, or calculous Parts of the nutritious Juice of the *Parenchyma* extravaſated in Maſſes.

The *Acetarium* is a Subſtance of a tart, acid Taſte, of a globular Figure, inclos'd in an Aſſemblage of ſeveral of the ſtony Parts above-mention'd. 'Tis of the ſame Subſtance with the *Parenchyma* and the Marrow, though 'tis almoſt impoſſible to determine from which of thoſe two Parts it proceeds immediately.

As for the Origin of the *Stone*, the various ſtony Corpuſcles 'tis compos'd of are nothing elſe but ſeveral Parts of the Juice, indurated, and coagulated, by Precipitation, like thoſe we ſee often in the *Sediment* of *Urine*, in *Wine Caſks*, &c.

In the Plumb, Cherry, *&c.* there are four Parts, *viz.* a Coat, *Parenchyma*, Ramification, and Stone, or *Nucleus*. The Coat, *Parenchyma*, and *Fibres*, have the ſame Origin, and are form'd in the ſame Manner, as in Apples and Pears; but the *Fibres* have a different Diſpoſition. There are in all Sorts of Plumbs five large *Fibres* extended over the Surface of the Stone, from the Baſe to the Point; four on one Side, and one on the other. The ſame Number is found in Apricots, with this Difference, that the *Fibre* which is ſingle on one Side, is not extended on the Surface of the Stone as in Plumbs, but penetrate into the Stone. On the other Side there are likewiſe found between the four large *Fibres* heretofore mention'd, two or three ſmaller *Fibres*, which, after having, like the others, a little extended themſelves on the Surface of the Stone, penetrate into the Pulp, and are diſpers'd therein. Laſtly, there are in all the Parts of *Peaches* a very great Number of theſe ſmall *Fibres*.

But notwithſtanding the different Diſpoſition of theſe *Fibres*, obſerv'd in the *Fruits* here mention'd, that which is ſingle is diſpos'd in the ſame Manner in all, *i.e.* that it enters the Stone, at the Baſe, and after it has extended it ſelf in the very Subſtance of the Stone, it enters the middle Cavity, through the Point, where the *Kernel* is ſuſpended by its *Envelope*.

The Stone is a compos'd Body, though at firſt it appears ſimple. Its inner Part is the thinneſt, and is alſo whiter, denſer, and more poliſh'd than the reſt. It derives from the *Medulla*, and the Manner 'tis form'd is very curious, but not eaſily obſerv'd. For as the *Fibre* of the *Seed* does not penetrate it directly through the Baſe, but only through the Point, it carries along with it a conſiderable Part of the *Medulla*, which gathers round it, and forms a kind of *Parenchyma*; ſo that penetrating into the Cavity of the Stone through the Point, that *Medulla*, or *Parenchyma*, which ſurrounds it, enters likewiſe, and being there coagulated, forms in the whole Extent of that Cavity a kind of white Lining, hard, and poliſh'd.

The external Part of the Stone, which is the thickeſt, is compos'd of ſeveral Parts, which are precipitated and coagulated, as in Pears; with this Difference only, that in Plumbs, and other ſuch *Fruits*, the precipitated Parts are ſtill nearer to one another, and are not only contiguous, but form, likewiſe, a continu'd Stone, and all of a Piece. It is ſo very true that the *Stones* are form'd thus, that even in Pears the *Stone* is the ſame, eſpecially toward the Eye of the Pear; and it is alſo in the ſame Manner that in Animals ſome Parts of the *Urine* which are precipitated, form a Gravel, and afterward Stones. But we muſt obſerve, that as in the Stones of Pears there is a *Parenchyma* mix'd with the ſtony Corpuſcles; there is one, likewiſe, in the Stones of Plumbs, mix'd with the precipitated and coagulated Parts. 'Tis true, that the Stone being form'd, thoſe Parts are not ſo eaſily diſtinguiſh'd; but, notwithſtanding, the Foundation of all Stones is nothing elſe but a perfect *Parenchyma*, which by thoſe Precipitations and Coagulations which gather round it, ſuffers ſuch Alteration, as to become dry and hard; ſo that it is impoſſible to diſtinguiſh it from thoſe Parts which are coagulated.

The *Nut*, analogous to which is the *Acorn*, conſiſts of a Shell, *Cortex*, and *Medulla*. The Shell conſiſts of a Coat and *Parenchyma*, deriv'd from the Bark and Wood of the *Tree*. The *Cortex* is alſo a Body compos'd of ſeveral different Subſtances; its Surface is a Duplicature of the inner Tunick of the Shell, which, towards the Baſe, folds it ſelf, and extends on the *Cortex*, which it covers almoſt entirely; of which we are eaſily convinc'd, when we examine it. For we ſee then that the Baſe of the *Cortex* is continu'd with the *Parenchyma* of the Coat, from which it is not ſeparated by the Skin. Whence it enſues, that the ſuperficial Part which covers almoſt the whole *Cortex*, and which is but a Continuation of the Skin of the Coat, is not found in the Baſe, whereby the *Cortex* and Coat are join'd. The inner Part of the *Cortex*, which is the thickeſt, is not a *Parenchyma* ſemblable to the Coat, but mix'd with ſeveral precipitated and coagulated Parts; as in the Stones I have deſcrib'd already, and are even intermix'd with ſeveral *Fibres*, or Branches of the *ligneous* Body; with this Difference, that in the *Cortex* the *external Fibres*, which are not appointed to nouriſh the *Seed* or *Kernel*, are in a conſiderable Number, coming from the *Parenchyma* of the Coat, to enter into the *Cortex* through the Baſe, are ſeparated in round like the Threads of a Puff, and thus extend themſelves on the *Circumference* of the *Cortex*, as far as the Point, between the Skin and the inner Part of that *Cortex*, which is nothing elſe but a coagulated *Parenchyma*. As for the *inner Fibre*, which ſerves to nouriſh the *Seed*, 'tis always ſingle, and coming from the *Coat* between the two others, it enters thro' the Baſe of the *Cortex*, and is not extended in the Body of that *Cortex*, as in the Body of the Stones of Plumbs, to go and unite it ſelf to the *Kernel* by the Point, but paſſes directly through the *Center* of the Baſe, into the *Medulla*, which it penetrates and runs throughout its whole Length, as far as the Point of the *Cortex*, to which the Skin of the *Kernel*, or *Seed*, adhere. But whether the *Medulla*, or Pulp of the *Kernel*, ariſes from the Pith of the *Tree*, or the cortical Part of the *Fruit*, is not agreed.

Berries, as *Grapes*, &c. are compos'd of three Parts, beſides Grains of a ſtony Nature, *viz.* the Coat, *Parenchyma*, and *Fibres*.

The Origin of the Coat is the ſame, as in the other *Fruits* heretofore mention'd; but there are found in theſe, two Sorts of *Parenchyma:* The firſt, call'd *external Parenchyma*, is adherent to the Coat; and as it is of an extreme Acidity, 'tis commonly ſpit out, when thoſe *Fruits* are eaten. It derives from the *Parenchyma* of the *Cortex* of the Branch, and the Pores of both, as well as of the *Medulla*, are viſibly diſpos'd in the ſame Manner. The other, call'd the *inner Parenchyma*, is that which is commonly eaten; its Taſte is ſo grateful, and it ſelf ſo tender and delicate, that it ſeems but as a thicken'd Juice, though it be a true *Parenchyma*, whoſe Pores are very large, and full of Liquor, like thoſe of Oranges and Lemons.

There are alſo in theſe *Fruits*, like in the others, two Sorts of *Fibres*. The *external* ones are extended in curve Lines, between the Coat and *external Parenchyma*, from the *Pedicle* to the Baſe of the Flower; and though they be not always in the ſame Number towards the *Pedicle*; however, there are ten found towards the Baſe of the Flower, five of which ſerve to the five Leaves of the Flower, and the five others to the Leaves of the *Calyx*. As for the inner Fibres two are commonly found diametrically oppoſite to each other, which, towards the Baſe of the Flower, are mixed with thoſe already mentioned, and being divided afterwards into ſeveral ſmaller, each of theſe ſmall Fibres has a Grain tied to it, into whoſe Coat it enters by two Filaments, one whereof anſwers to the Baſe,

Baſe, and the other to the Point of the Grain. Thoſe Fibres are all white and big enough for us to ſee eaſily; when cut obliquely, they are hollow, and true ſpermatick Veſſels, ſince they have very near the ſame Figure, and the ſame Uſe as thoſe of Animals.

From this neceſſary and accurate Examen of the *Flowers*, and Fruits of *Plants*, which, I hope, will flatter agreeably the Curioſity of the Reader; I'll proceed to the Diſtribution of *Plants* by Mr. *Ray*, into 25 *Genera*, or Claſſes, under the following Denominations; and from that to their Analyſis and Virtues.

The firſt Claſs contains *imperfect Plants*, ſuch as appear to want the Flower and Seed, as *Corals*, *Sponges*, *Truffles*, *Moſs*. The 2d produce *Plants* of an imperfect Flower, and whoſe Seed is too ſmall to be diſcerned by the naked Eye; ſuch are *Fern*, *Polypody*, *&c.* The 3d, thoſe whoſe Flowers want *Petala*, as *Hops*, *Hemp*, *Nettles*, *Docks*, &c. 4th, Thoſe with a compound Flower, and which emit a milky Juice, when cut, or broke, as *Lettuce*, *Dandelion*, *Succory*, &c. 5th, Thoſe of a compound Flower of a diſcous Form, and whoſe Seed is winged with Down, as *Coltsfoot*, *Flea-bane*, &c.

Note, that winged Seed are ſuch as have Down or Hairs on them, whereby the Wind taking hold, blows them to a Diſtance.

The 6th contains *Herbæ Capitatæ*, or thoſe whoſe Flower is compoſed of long fiſtulous Flowers gathered into a round Head, and covered with a ſcaly Coat, as the *Thiſtle*, *great Burdock*, *Blue Bottle*, &c. 7th, *Corymbyferous Plants*, with a diſcous Flower, but no Down, as the *Daiſy*, *Yarrow*, *Corn-Marygold*, &c.

Note, That *Corymbus*, among the antient *Botaniſts*, was particularly uſed to expreſs the Bunches, or Cluſters of Ivy-berries. Some alſo call the Top of the Stalk of a *Plant*, when ſo ſubdivided, and adorned with Flowers, or Fruits, as to make a round ſpherical Figure, by this Name; as the Tops of *Leeks*, *Onions*, and the like; and others confound the Word with *Umbrella*, which expreſſes the flowery Tops of ſuch *Plants* as have their Branches and Flowers ſpread round, into the Form of an *Umbrella*. But among the modern *Botaniſts*, *Corymbus* is chiefly, for a compound diſcous Flower, whoſe Seeds are not pappous, *i. e.* do not fly away in Down, nor blown any where about with the Wind.

The 8th contains *Plants* with a perfect Flower, but only one Seed to each Flower, as *Valerian*, *Agrimony*, *Brunet*, &c. 9th, *Umbelliferous*, or thoſe of five *Petala*, ſpread out like an *Umbrella*, and two Seeds to each Flower. This is a very large Genus of *Plants*, and are diſtinguiſhed by the ſame Author into ſeven Species, *viz.* thoſe with a broad flat Seed, like a Leaf, as wild Garden *Parſnips*; with a longiſh and larger Seed ſwelling in the Middle, as *Cow Weed*, and *wild Chervil*; with a ſhorter Seed, as *Angelica*; with the tuberous *Root*, as the *Earth-nut*; with a ſmall ſtraited *Seed*, as *Caraways*, *Saxifrage*, and *Brunet*; with a rough hairy *Seed*, as *Parſly* and *wild Carrot*; with entire Leaves ſubdivided into *Jags*, as *Sanicle*, and *Thorough-Wax*. The 10th contains *Stellate Plants*, whoſe Leaves grow round the Stalks at certain Intervals in Form of Stars, as *Mug-weed*, *wild Madder*, *Croſs-wort*, *Mollugo*, *Aſperula*, or *Woodruff*, *Gallium*, or *Ladies Bed Straw*, *Aparine*, or *Cleavers*, *Rubia Tinctorum*, or *Dyer's Madder*; to which may be added, as a kin to this Genus, the *Naſturtium indicum*, *Indian Creſs*, or *Yellow Lark Spur*. The 11th, *Rough leav'd Plants*, which have their Leaves placed alternately, or in no certain Order along the Stalks, as *Hound's-Tongue*, *Mouſe-Ear*, &c. 12th, *Suffrutices*, or *verticillate Plants*, whoſe Leaves grow by Pairs on their Stalks, one Leaf right againſt another, the Flower being monopetalous, and uſually in Form of a Helmet. The ſame Author makes two Species of theſe *verticillate Plants*. 1. The *Fruticoſæ*, of ſuch whoſe Superficies is perennial; theſe again have either a plain Flower, as the *Chamædrys vulgaris*, *Thucrium*, and the *Marum Syriacum*, or a Flower with a Lip, called *labiated Flower*; or one ſomething in the Form of a Helmet, called *Galeated*, as the *ſacria Stæchos*, *Hyſſopus*, *Roſmarinus*, *Satureia*, *Marum vulgare*, *Thymum vulgare*, and the *Polium Montanum*. 2. The *Herbaceæ*, or ſuch, whoſe Stalks are not perennial; theſe are the *Menthæ*, *Verbena*, *Dictamnus*, *Creticus*, *Origanum*, *Majorana*, *Ocimum*, *Horminum*, *Galeopſis*, *Nepeta*, *Betonica*, *Prunella*, *Stachys*, *Clinopodium vulgare*, *Lamium*, *Molucca*, *Hedra Terreſtris*, *Galericulata*, *Calamintha*, *Meliſſa*, *Marrubium commune*, *nigrum*, *& aquaticum*, *Chamæpitys*, *Scarodonia*, *Scordium*, *Bugula*, *Syderitis*, *Cardiaca*.

The 13th contains the *Polyſpermous Plants*, which are thoſe which have more than four Seeds ſucceeding each Flower, without any certain Order or Number. Theſe are alſo ſubdivided into 1. Such as have a *Calyx* or *Perianthium*, conſiſting either, firſt of three Leaves, and the Flower *Tripetalous*, as *Plantana Aquatica*, and the *Sagittaria*, both Water-Plants, or the Flower *Polypetalous*, and the *Calyx* falling with it, as the *Chelidonium minus*, or remaining after the Flower is dropped, as in the *Hepatica mobilis*. *Secondly*, Of five Leaves, in ſome deciduous with the Flower, as in the *Ranunculus*; in others *Perennial*, as in the *Helleborus niger ferulaceus*; or *Annual*, as in the *Flos Adonis*. *Thirdly*, Of eight Leaves, as the *Malva* and *Alcea*. *Fourthly*, Of ten Leaves, as the *Caryophylla*, *Fragaria*, *Pentaphyllum*, *Tormentilla*, *Argentina*, *Althæa*, and *Pentaphylloide*.

2. Such as have no *Calyx*, or *Perianthium*, as the *Clematitis*, *Filipendula*, *Ulmaria*, *Anemone-Nemorum*, *Pulſatilla*, &c.

In the fourteenth, are the Bacciferous *Plants*, or ſuch as bear Berries, as *Briony*, *Honey-Suckle*, *Solomon-Seal*, *Lilly of the Valley*, *Nightſhade*, *Aſparagus*, &c. The 15th contains the *Multiſiliquous*, or *Corniculate Plants*, which after each Flower, produce ſeveral long, ſlender *Siliquæ*, or Caſes, wherein their Seed is contained, as *Orpine*, *Navel-wort*, *Bears-Foot*, *Columbines*, &c. The 16th, *Vaſculiferous Plants*, with a *Monopetalous* Flower, and which after each Flower, have a Veſſel beſides the *Calyx*, containing the Seed; which is ſometimes divided into Cells. They have their *Monopetalous* Flower, either uniform, or difform. The former have all their Seeds divided. 1. Into two Partitions, as the *Hyoſcyamus*, *Incotiana*, *Priapeia*, and the *Gentiana*. 2. Into three Partitions, as the *Convolvulus*, *Speculum Veneris*, *Trachelium*, *Repunculus*, or *Campanula*, *Repunculus Corniculatus*, &c. 3. Into four Partitions, as the *Stramonium*. Thoſe of the latter Kind, which have a difform *Menopotalous* Flower, as the *Linaria Pinguicula*, *Antirrhinum*, *Ariſtolochia*, *Scrophularia*, *Digitalis*, *Pedicularis*, *Melampyrum*, *Euphraſia*, &c. Mr. *Ray* makes three Claſſes of this *vaſculiferous Plants*, which I have reduced here into one; and therefore proceed to the 20th, which contains the *leguminous Plants*, or ſuch as bear Pulſe, with a papilionaceous Flower, conſiſting of four Parts, joined at the Edges, as *Peaſe*, *Beans*, *Vetches*, *Tares*, *Lentil*, *Liquorice*, *Trefoil*, &c. The 21ſt, *Plants* with a true *Bulboſe Root*, as *Garlick*, *Daffodil*, *Hyacinth*, *Saffron*, &c. The 22d, thoſe whoſe *Roots* approached nearly to the *Bulboſe* Form, as *Flower-de-lis*, *Cuckow-Pint*, *Baſtard Hellebore*, &c. The 23d, *Culmiferous Plants*, with a graſſy Leaf, and an imperfect Flower, having a ſmooth, hollow-jointed Stalk, with a long, ſharp-pointed Leaf at each Joint, and the Seeds contained in a chaffy Huſk, as *Wheat*, *Barley*, *Rye*, *Oats*, and moſt Kinds of *Graſs*. The 24th, *Plants* with a graſſy Leaf, but not *culmiferous*, with an imperfect or ſtamineous Flower, as *Ruſhes*, *Cats-Tail*, &c. And in the 25th are contained *Plants*, whoſe Place of Growth is uncertain, chiefly *Water-Plants*, as the *Water-Lilly*, *Milk Wort*, *Meadtail*, &c.

It has been the Opinion of ſome among the ancient *Botaniſts*, that *Plants* uſed to degenerate, *i.e.* that a *Plant* of one Kind was often changed into that of another viler Kind. Thus, ſaid they, *Wheat* degenerated into *Darnel*, *Barley* into *Oats*, *Ocimum* into *Serpyllum*, *Syſymbrium* into *Mint*, *Caulis* into *Rapa*, &c. The *Plantule* or *Stamen* of the future Vegetable, they hold to exiſt in the Seed; ſo that to produce ſuch a *Plexus*, or Organiſm, a Matter ſo and ſo prepared is required; and added that the Matter in the Soil, where the Seed is lodged, being ſuch as is incapable of producing the ſaid *Plexus*, it muſt neceſſarily change into another of a different Nature from that of the Seed required, though in ſome Reſpects alike, and approaching thereto: Thus *Darnel* and *Wheat* in many Reſpects agree; ſo alſo *Serpyllum* and *Ocimum*, &c. They allowed, however, that there was no Degeneration in the *Root*, but only in the Seed, inaſmuch as the Root already ſuppoſes a perfect Organization. But our lateſt and beſt *Botaniſts* maintain ſuch a Degeneration, or Tranſmutation, to be a Chimera; not, but they allow that a *Plant*, by being tranſplanted to an improper Soil, or Sun, may be depraved; ſo as a *Dutch* Roſe of an hundred Leaves may only produce another Roſe far ſhort thereof in Number of Leaves, Colour, Smell, *&c.* Such a Depravation is poſſible, and frequently happens; but a ſpecifick Transformation ſeems out of the Power of Nature; a new Form ever ſuppoſing a new Generation, which again ſuppoſes a Corruption of the former Kind, founded on this Axioma, *Corruptio unius, eſt Generatio alterius.*

Before we attempt to enumerate, to make the *Analyſis*, and diſcover the Virtues of the *Plants*, contained in the ſeveral Claſſes, or *Genera* abovementioned, which M. *Tournefort* reduces to fourteen, as leſs burthenſome to the Memory, it is proper to define certain Terms, which are to be uſed in the Sequel, and inform the Reader of the Rule obſerved in the Diſcovery of theſe ſeveral Things.

By the Chymical *Analyſis* of *Plants* is underſtood the Separation of their Principles, by Fire and convenient Veſſels, to effect which, freſh *Plants* are diſtilled in Alembicks, in *Balneo Mariæ*; or elſe before they are diſtilled, they are put into Fermentation or Digeſtion for ſome Time, according to the Nature of the *Plants*, and the Deſigns of the Artiſt. The Subſtances extracted from them are to be divided into Portions, of five or ſix Ounces each. That their reſpective Character may be examined ſeparately; by that Means, are extracted, their Flegma, ſpirituous Water, or *ardent Spirit* of *Plants*. When the Diſtillation is ended, the Grounds left are put into a *Cornue*, whence by a graduate Fire, are extracted from almoſt all *Plants* an urinous Spirit, a concrete volatile Salt, and a *fœtid Oil.* From the *Caput Mortuum* lixiviated, is ſeparated by Filtration and Evaporation, the Salt which was mixed with the Earth. Without this Operation it would be impoſſible to diſcover which Sort of Salts are contained in *Plants*, and which Salt is predominant; which muſt be as neceſſarily known, to diſcover the Virtues of *Plants*, and before they can be employed with any Appearance of Succeſs in Medicine.

To proceed with ſome Order in that Diſcovery, we muſt previouſly know what's underſtood by the different Salts found in *Plants*, ſince they all contain ſome of thoſe Salts, more or leſs; therefore,

1. By *Alkaly* and *acid Salt*, are underſtood thoſe two Sorts of Salts, to which our modern Phyſicians and Chymiſts have given thoſe Names; and which are eaſier underſtood than defined.

2. By *eſſential Salt* is underſtood that formed by the Cryſtalliſation of the Juice of *Plants*.

3. By *volatile Salt* is underſtood the Salt, which by the Diſtillation through the *Cornue*, adheres at the Top of the Veſſel.

4. By the *fixed* or *fixt Salt*, is underſtood the *Salt* extracted by Elixiviation, from the Aſhes of burnt *Plants*, or from the *Caput Mortuum*, of thoſe which are analyſed.

This, 'tis true, informs us of the Difference of thoſe ſeveral Salts; but how ſhall we know if they are all contained in the *Plant*, or only in Part; or which is the Predominant? By the following Means.

1. The *acid Salt* is diſcovered, by being mixed with Salt of *Tartar*, or Spirit of *Sal-Armoniack*, or like Matters, with which Acids ferment commonly. The Acids are alſo diſcovered by the blue Paper, which they change red by Degrees, from a very pale red to a very high one.

2. The Spirit of *Nitre*, of *Salt*, of *Sulphur*, of *Vitriol*, and other *Acids*, are employed with Succeſs, to diſcover the *Salt Alkaly*; for thoſe Acids ferment with the *Alkaly*.

3. As the *Sal-Armoniack* is eaſily diſcovered, by its urinous volatile Salt, *Botaniſts* and Chymiſts make Uſe of the Oil of *Tartar* to diſcover if there is any armoniack Salt in *Plants*, for then they exhale an urinous Spirit, like to that exhaled from Urine, or the armoniack Salt itſelf.

4. As the Character of *Nitre* is diſcovered by *Detonation*, 'tis thought, that the ſureſt Expedient to know nitrous Subſtances, is by throwing them upon burning Coals.

5. Every Body knows that the chief Quality of Vitriol is to turn Black the Infuſion of Galls, therefore the Matters under Examination are to be mixed with that Infuſion.

6. To know if there is any Sulphur in ſome Matter, that Matter muſt be put into Digeſtion, in a very ſtrong Spirit of Wine. If the ſame Matter burn eaſily, 'tis a certain Sign that they contain abundance of ſulphureous Particles. The *Elaterium*, when dry, burns at the Candle, and the *Sedum majus vulgare* of *C. Bohinus*, does not burn, therefore the former contains a ſulphurous Matter, not to be met with in the latter oleaginous Subſtances, when mixed, makes a Ladder when with Oil of Tartar.

With the Aſſiſtance of theſe Elucidations, we'll proceed to the Enumeration of the Plants, and to the Diſcovery of their ſeveral Qualities and Virtues, in an alphabetical Order, as the moſt agreeable to our Work, contenting our ſelves with the Deſcription of thoſe which are better known, and more uſeful; for we cannot undertake in this Treatiſe to examine all the Particularities of the *Vegetable World*, which have been the Subject of ſeveral very large Volumes: Though what we have ſaid already of *Botany*, is ſufficient for a whole *Treatiſe*. But as I deſign to oblige our *Readers* as far as the Limits I have preſcrib'd to my ſelf will admit; I cannot help giving them the following ſhort *Herboriſation*.

ACETOSA PRATENSIS, or *Sorrel*, with long *Leaves*. The Root of this Plant is not ſour, as *Matthiolus* believ'd it, but, on the contrary, very bitter, very aſtringent, and changes but very little blue Paper into red; while, on the contrary, the *Leaves* change it as much as *Allum* does. The red of the *Leaves* keeps on, and that of the *Root* diſappears. The *eſſential Salt* of *Sorrel* is a Mixture of *Sal Ammoniac* and of *Nitre*. In the Roots thoſe two Sorts of Salts are united with a ſmall Quantity of fœtid Oil, and with much Earth; and in the Leaves they are diſſolv'd in a very great Quantity of Phlegm. There is no Vitriol in *Sorrel*.

The Virtues of the Parts of *Sorrel* are different: The *Roots*, wherein *Sal Ammoniac*, Sulphur, and Earth are predominant, carries off the Digues which obſtruct the Circulation of the Blood in the *Viſcera*; they are preſcrib'd in Decoctions, aperitive Diet-Drinks, *&c.* The *Leaves*, on the contrary, which are very ſour, are cooling, and hinder the too great *Fermentation* of the Blood, and the too great *Effervescence* of the Bile. The Uſe of the *Roots* and *Leaves* of this Plant are a good *Remedy* for the Scurvy.

ALTHÆA, *Maſhmallow*. *Moriſon* and Mr. *Ray*

have taken the Flower of this Plant to be of five *Leaves*, though M. *Tournefort* ſays, that it is all of a Piece. The *Leaves* of *Maſhmallows* are glutinous, inſipid, and do not change the *blue* Paper. The *Roots* have the ſame Taſte, but change a little the *blue* Paper. The glutinous Juice of this Plant appears to be a Mixture of a great deal of Phlegm, of a conſiderable Portion of Earth, Acid, and Sulphur.

All Authors agree that this Plant ſweetens the Blood, and is *emollient*. It not only blunts the corroſive Salts, but likewiſe ſoftens the *Fibres*, when too much ſtrain'd, and reſtores them to their natural Motion, and thereby appeaſes Pain. In Diet-Drinks, or *Tiſanes*, they are an excellent *Remedy* for a violent Cough; and in the *Nephritick* for the *Retention* of Urine, attended with Inflammation. 'Tis alſo adminiſter'd, for the ſame Maladies, in Syrups, Tablettes, or Lozenges; in Lohoch in Clyſters for the Inflammations of the Abdomen; in *Unguentum* for the Sciatick and Rheumatiſm; to reſolve Tumours with Inflammation; in Poultices with Milk, to bring thoſe Tumours to Suppuration when the Matter is diſpos'd for it, *&c.*

ASTER, *paluſtris luteus, folio longiori, lanuginoſo, Star-wort*, or *Cole-wort*. This Plant is very common, though known but to very few; its Root is an Aſſemblage of ſeveral white Fibres, waving, of four or five Inches long, of half a Line thick, tied to the Head, whence iſſues ſome Filaments or Threads, which running between two Earths, ſerves to the Multiplication of that *Plant*; its Stalks grow three or four together, of a Foot and a half, or two high; they are ſometimes purple towards the Bottom, one and a half, or two Lines thick, branched a-top, full of *Medulla*, and covered with Down, or ſhort Hairs; the lower Leaves are half a Foot long, and an Inch, or an Inch and a half broad, piked at both Ends, a little waved, or watered on the Edges, covered with Hairs, like to thoſe of the Stalks, but ſometimes longer, raiſed with a thick, whitiſh, or purple Rib, a little round underneath; this Rib ſprouts forth ſome Fibres, which extend obliquely on the Edges. The Leaves which accompany the Stalks are alternate, of three or four Inches long; they ſometimes grow higher towards the Top, where they ſeize half the Stalk, by a round Baſe, of very near an Inch broad; the Branches are cloſe enough towards the Stalk, and are divided into three Twigs, each of which ſupports a radiate, yellow Flower, of an Inch, or an Inch and a half broad. The Diſk of the Flower is compoſed of very near 350 other ſmall Flowers, of three Lines high, and divided into five Points, with a very ſhort and forked Filament; the Crown is of 50 or 60 ſmall Flowers of the ſame Colour, which have very near ten Lines in length, or half a Line in breadth. The Embrio's of the Grains, which ſupport the ſmall Flowers, and half ſmall Flowers, are white, fine, and of a Line high; in Proceſs of Time they grow bigger and brown, and their Acgreet, which is white, is very near three Lines high. The Root of this *Plant* is very bitter, acerb, and oily, it ſmells like Hay overheaten; its Leaves are bitter, likewiſe, but without Aſtriction. It delights in humid Places, blows in *July*, *Auguſt*, and *September*, and towards the latter End of *Auguſt* its Grains ripen. Its *Root* is far better drawn in the *Memoirs* of *Pena* and *Lobel*, than in the Hiſtory of the Plants of *Lions*.

AGRIMONIA, *Agrimony*, is of a ſtiptick Taſte, a little ſalt, and mix'd with ſome Acrimony, and changes a little *blue* Paper; which makes one believe that it contains a Salt which approaches very near the vitriolated Tartar, or the Salt of Coral made with Spirit of *Verdigreaſe*. This Salt in *Agrimony* is mix'd with a great deal of Sulphur, and with much Earth; therefore 'tis *aſtringent*, *deterſive*, *vulnerary*, and *aperitive*. *Agrimony* is very good in chronick Maladies; for it abſorbs and inciſes the thicken'd *Lympha* which occaſions them. 'Tis us'd in Diet Drinks, Decoctions, and in aperitive, cooling, and vulnerary Draughts, or Juleps. This is of a very great Succour in the ſpitting of Blood, in the Bloody Flux, and in the Inflammation of the Liver. Apply'd *externally*, 'tis vulnerary, and proper to reſolve the Tumours of the *Scrotum*, or Purſe; and of all other Parts where there is Inflammation. *Targus* aſſures us, 'tis boil'd in *Lees* of Wine, with Bran of Wheat, and apply'd on the Part.

ALCHIMILLA MONTANA, *Perſepier*. Mr. *Ray* aſſures us, that the Flower of this Plant is compos'd of four *Leaves*; but M. *Tournefort* ſays, that it is *ſtamineous*, and that Mr. *Ray* has miſtook the *Calix* for the *Flower*, which is all of one Piece. *J. Baubin* will have its Root black and hollow; in *France* 'tis ſolid, and yellowiſh: The whole Plant, there, is very inſipid; but here, Mr. *Ray* and *Lobel* ſay, that it is acerb. *Fabius Columna*, who gives an excellent Figure of it, and to whoſe Deſcription nothing is wanting but that of the *Flower*, obſerves, that the Figure of *Pena* and *Lobel*, of the *Engliſh Perſepier*, is very bad; that of *Taberna Montanus*, who calls it *Scandix minor*, is not better; and that of *Parkinſon* worſe.

ALCHIMILLA SUPINA, *Knawel*. *Tournefort* ſays, that Mr. *Ray* is in the right to place this Plant among the *ſtamineous*, but that he has varied in the Deſcription of its *Flower*, by pretending that it is of five ſmall *greeniſh Leaves*, than agree that that Part ſhould be rather call'd the *Calix*, and that the *Seed* ſupported that *Calix*. *Tournefort* gives this Deſcription of the Parts of that Plant: The *Flowers* grow in ſmall Bunches, in the Arm-pits of the *Leaves*, and at the Extremities of the *Branches*; they are of five very ſhort *Stamina*, which grow from the Bottom of the *Calix* with yellow Tops; the *Calix* is of a whole Piece, of two Lines long, *greeniſh*, open'd a-top, and divided into five Points, diminiſhing toward the Bottom, in the Form of a Pipe, a little ſwell'd; after the *Stamina* are wither'd, the Piſtil plac'd at the Bottom of the Pipe becomes a Grain, ſomewhat oval, whitiſh, and of a Line long; and then the *Calix* grows hard, and yellowiſh.

ALKEKENGI, *Winter Cherry*. Its *Leaves* are acerb, and bitter; they do not change the *blue* Paper, but the Fruit changes it very much. It appears, at firſt, ſouriſh, and afterwards bitter; which makes one conjecture, that in the Fruit of that Plant there is a Salt approaching very near the *Oxyſal angeli ſale*, mix'd with a ſmall Quantity of fœtid Oil. In the *Leaves* that Salt is too well wrapp'd up in ſulphurous and terreſtrial Particles to be felt. The *Alkekengi* is very *aperitive* and *diuretick*. *Dioſcorides* us'd to give it for the *Green Sickneſs*, and *Retention* of *Urine*. *Arnaud de Villeneuve*, and *Ceſalpinus*, advis'd the Dropſical, and thoſe who had a *Retention* of *Urine*, to drink Wine wherein had been bruis'd three or four Fruits of this Plant. The Fruit of *Alkekengi* is prepar'd into *Troches*.

ALYSSON, *incanum luteum*. The Figure of *Cluſius* is good, but he has miſtook in the Deſcription of the *Flower*, which is not of four *Leaves*, nor of five, as he pretends.

AMARANTHUS, *Silveſtris, & vulgaris*. The *Root* of the *Amaranth* we ſpeak of, is whitiſh, ſometimes purple, of very near half a Foot long, divided into hairy *Fibres*, the Stems lie on the Ground, branch'd, of very near a Foot long, of two or three Lines thick, reddiſh, full of Juice, garniſh'd with *alternate Flowers*, like thoſe of the Parietary, of very near two Inches long, the Tail included, which is very fine, and almoſt as long as the reſt of the Leaf, which is of a *pale green*, ſometimes, with purple Borders, of ſeven or eight Lines broad, divided into two equal Parts by a Rib, which extends from one End to the other. The Arm-pits are fill'd with ſeveral *Flowers* heap'd upon one another, like Cluſters of Grapes; each *Flower* has commonly *three Leaves*, very narrow, and very picked, plaited like a Spout, of a Line long, whitiſh, and the Back greeniſh: From the Middle of the *Flower* riſes an oval and pointed Piſtil, environ'd with three very fine *Stamina*, ſcarce a Line in Length, each ſupporting a yellowiſh Top: That Piſtil becomes,

comes, in Time, a *Capſula* of a Line long, oval, flat, membranous, and terminated by a ſmall Fillet; 'tis compos'd of two Pieces which carry one upon the other. In each *Capſula* is found a *Seed*, almoſt round, black, ſhining, poliſh'd, and which has the Form of a *Lentil*. This Plant is found during the whole Summer, and Autumn, in Gardens, in the Yards of Houſes, *&c.*

ANACAMPSEROS, *Orpin.* This Plant analiz'd, gives a great deal of Acid, ſome Earth and Oil, a ſufficient Quantity of volatile concrete Salt; ſo that there is Room to believe that it contains an aluminous Salt mix'd with *Sal Ammoniac*, wrapp'd up in a ſmall Quantity of Sulphur. 'Tis *deterſive*, *aſtringent*, and *vulnerary*. Apply'd *externally*, it haſtens the Suppuration of Tumours.

ANAGALIS, *Flore cæruleo, Calves-Snout*, in *French Mouron*. Its *Flower* is divided into five Quarters, and its *Fruit*, which is ſpherical, loſes half its Coat when the *Seeds* are ripe. *Tragus* ſays, that a Glaſs of Wine in which the *Anagalis* has been boil'd for a very ſhort Time, is a good *Remedy* againſt the Plague, provided the Patient keeps his *Bed*, not to interrupt the Sweat which that Liquor provokes. He orders the ſame *Remedy* to thoſe who have been bit by a *Viper*, or by a *mad Dog*; and adviſes them to waſh the Wound with it, and to apply the *Herb* to it. *Hartman*, *Mynſicht*, *Rolfinſius*, *Michael*, *Willis*, and ſeveral others, prize much the Uſe of this Plant in the *Mania*; and even when thoſe afflicted with a continual *Fever* are *delirious*, or *light-headed*, if the *Anagalis* be taken in *Decoction*, or *ſteep'd* in Spirit of Wine. The Extract has the ſame *Virtues*. *Simon Pauli* ſpeaks of a *Cataplaſma*, or Poultice, of *Anagalis* boil'd in *Urine*, as of a *Remedy* us'd in his Country.

ANONIS, *Reſt-harrow*. Its Flowers are diſpos'd *three* and *three*, and purple; its *Leaves* have a leguminous Taſte, and ſtink. The *Anonis* is very *aperitive* and *diuretick*; the *Roots* are preſcrib'd in Diet-Drinks and Apozems; the Water of the whole Plant is diſtill'd while in Flower. All theſe Preparations are very good for the *yellow Jaundice*, for the *Calculus*, for the Suppreſſion of the *Menſes*, and for the Piles, when they are inflam'd. The Decoction of this Plant is very *deterſive*, and us'd with Succeſs in the Scurvy to waſh the Mouth, and clean the Gums.

APARINE, *vulgaris*, *Gooſe-graſs*, in *French Grateron*, or *Rieble*. *Pauli* aſſures us, that in *Denmark* they uſe the Water diſtill'd from this Plant in the Pains of the *Breaſt*; ſome drink it for the Pleuriſy.

APIUM, *paluſtre*, *Smallage*, in *French Ache*. *Cardus* ſays, that the *Apium Sativum*, which is our *Celery*, differs in nothing from the *Smallage*, or *Ache*, but in the Culture. This Plant is bitter, acerb, and aromatick. It contains a great deal of oily volatile Salt, by which the *ammoniac* Salt is not entirely diſcompos'd; but diſſolv'd into a great deal of Phlegm, and united to a great deal of Earth. By a chymical Analyſis, the *Apium*, or *Smallage*, gives a great deal of Sulphur and Earth, a reaſonable Quantity of urinous Spirit, and a little of *concreted volatile Salt*; therefore 'tis not ſurprizing if it be *aperitive*, *diuretick*, *ſudorifick*, *febrifuge*, and *vulnerary*. In an *intermitting Fever*, ſix Ounces of the Juice of this Plant are given at the Beginning of the Paroxiſm, or of the cold Fit; then the Patient muſt be well cover'd, which commonly makes him ſweat. A Drachm of the Extract of the *Leaves*, mix'd with two Drachms of *Kinkina*, is an infallible *Febrifuge* in a quartan Ague; and in all other Fevers, when there are Obſtructions in the Abdomen. In the Scurvy it ſtrengthens the Gums, and cleanſes the Ulceries of the Mouth. The *Root* is employ'd in Diet-Drink, Apozems, and Syrups prepar'd for the Deſopiation of the Parts. 'Tis one of the five *aperitive Roots*; and the *Seed* is one of the five ſmall *hot Seeds*. To diſſipate the Milk in the Breaſt, when no longer wanted, or troubleſome, there muſt be boil'd equal Parts of the Leaves of *Smallage* and Mint, in *Lard*; which being ſtrain'd through a Sieve, are afterward powder'd over with the *Seeds* pounded, and apply'd to the Breaſts.

AQUIFOLIUM, or *Agrifolium*, *Holly*, in *French Houx*. *Ceſalpinus* and *Dodoneus* have obſerv'd, that old *Holly* loſe inſenſibly their Thorns, and produce *Leaves* like thoſe of *Laurel*. There is a tall *Holly* in the Royal *Garden* of Plants at *Paris*, and another in the *Cloyſters* of the Monks of the Abby of St. *Dennis*, on which there are ſeen yet ſome thorny *Leaves*; but moſt of the others are without Thorns. *Geſner* has obſerv'd ſuch another in the *Garden* of St. *Genevieve*. *Ruel* aſſures us, that with the Bark of this *Tree* can be made *Bird-lime*. Mr. *Ray* has deſcrib'd the Manner how they make *Bird lime* in *England* of the Bark of *Holly*. *Dodonée* affirms, that ten or twelve *Berries* of *Holly* ſwallow'd cure the Cholick; and Mr. *Ray* ſays, that he has known a Lady, who after ſhe had try'd in vain all other *Remedies*, was cur'd by drinking *Milk* and *Beer* in which the Tops of the *Leaves* of *Holly* had been boil'd. *Matthiolus* pretends, that its *Roots* are very *emollient*, and *reſolutive*.

AQUILEGIA, *Sylveſtris*, *Celandine*, in *French Ancholie*. *Dodoneus* has far better known the Structure of the *Flower* of this Plant, than *Columna* and *Ceſalpinus*; for theſe two Authors ſpeak only of the Pipes 'tis compos'd of; but *Dodoneus*, beſide the Pipes, deſcribes the flat *Leaves* diſpos'd *alternately* among the Pipes. The *Celandine* is *aperitive*, *diuretick*, and *ſudorifick*. *Tragus* aſſures us, that a Drachm of the Powder of the *Root* taken in *Wine*, cures the Cholick. *Camerarius* relates, that in *Spain* they eat every Morning, for the *Calculus*, a ſmall Quantity of that *Root*. For the *Angina*, and the *Ulceries* in the Throat, *Pena* and *Lobel* prize Gargariſms made with the *Seeds* of this Plant; ſome uſe it in the Scurvy. Some pretend, that taken in Wine it *accelerates* the Birth. *Pauli* us'd to give Half a Drachm, or a Drachm of it, in a Glaſs of Water of *Fumiterre*, or of *Cardus Benedictus*, for the Small-Pox and Meaſles.

ARISTOLOCHIA, *Clematitis recta*, *Ariſtolochi*. *Fuſchius* and *Dodonee* agree that this Sort of *Ariſtoloch* may be us'd in lieu of the others, ſince it wants not *Bitterneſs* nor *Acrimony*. *Anguillaria* has even obſerv'd, that the *Root* of this *Species* was more aromatick; and *Bauhin* ſuppoſes that it is the ſame *Andromachus* and *Galen* us'd in the *Theriack* under the Name of *Ariſtolochia tenuis*. However, the *Leaves* of this are very bitter, and do not change the *blue* Paper; the *Roots* change it a little. 'Tis aromatick, and very bitter. By the Analyſis of this Plant it gives a great deal of an acid Liquor, a great deal of Oil and Earth, a ſmall Quantity of urinous Spirit, and no concrete volatile Salt. Its fix'd Salt does not change *yellow* the Solution of Sublimy; whence 'tis concluded that the Salt of *Ariſtoloch* approaches very near the Nature of the Salt of Coral, ſuch as that Salt would be if more Acid was pour'd over it than is wanted to quench the Coral. This Plant is *aperitive*, *ſudorifick*, *deterſive*, and *vulnerary*; its great *Bitterneſs* hinders it from being employ'd in *Juleps*; the *Powder* is given from one Scruple to a Drachm, for the *Hyſterick*, *Green-Sickneſs*, *Aſthma*, and *intermitting Fevers*; the *Root* is us'd in *Lotions* and *vulnerary Tinctures*.

ARTEMISIA, *vulgaris*, *Mugwort*, or *Motherwort*, in *French Armoiſe*. The *Mugwort* has a ſmall Taſte of Salt, and changes a little the *blue* Paper; which makes one believe that its Salt has ſomething of the Nature of *Sal Ammoniac*, but united with a great deal of Sulphur and Earth. All its Principles render the Plant very *aperitive*, and proper to regulate and provoke the natural Evacuations in Women. For the Vapours, the *Leaves* and *Flowers* of *Mugwort* are taken, inſtead of *Tea*.

ARUM, *Foleſoot*, or *Wild Spikenard*, in *French Cabaret*. The *Leaves* of this Plant are very *bitter*, and change much the *blue* Paper, as well as the *Roots*. It contains a great deal of oily, aromatick, volatile Salt, loaded with much Sulphur, acid, and *terreſtrial Particles*. By the Analyſis are extracted from this Plant,

Plant, much Oil and Earth, a ſmall Quantity of urinous Spirit, no concrete volatile Salt, and ſeveral acid Liquors. *Dioſcorides* aſſures us, that the Maceration of ſix Drachms of *Folefoot*, or *Aſarum*, purge as much as the *Hellebore*, and provoke the *Menſes*. He agrees that the ſame *Roots* are *Diureticks*, and proper for the Dropſy, and for the Sciatica. They purge both Ways, without the Patient being fatigu'd thereby. The Patient is made to drink a Glaſs of Wine wherein has been infus'd, for a whole Night, Half an Ounce of *Folefoot Roots*. This *Emetick* is good in *intermitting Fevers*, in the Dropſy, in the Gout and Sciatica, and particularly in *Diarrhœa's* and the Bloody Flux.

Betonica, *Betony*, in *French Betoine*. The *Leaves* of this Plant have the Taſte of Herbs, a little ſalt, are a little aromatick, and do not change the *blue* Paper. The *Flowers* change it a little, as well as the *Roots*, which, beſides, are very bitter. The *Betony* is full of Sulphur, mix'd with a ſmall Quantity of oily, volatile Salt, and ſome Earth. By the Analyſis are extracted from this Plant a great deal of Oil, a little Earth and fix'd Salt, no concreted volatile Salt, but a ſmall Quantity of urinous Spirit. *Betony* is *vulnerary*, *aperitive*, *diuretick*, proper for the Maladies of the Head, and of the Abdomen. They are us'd in lieu of *Tea*, for the Vapours, Sciatica, the Gout, Head-ach, Jaundice, and for the Palſy. The Diet-Drink made of *Betony-Leaves*, the Water it has been macerated in, the Conſerve of its *Flowers* and *Leaves*; the Juice and Extract of its Parts, have the ſame Virtues. Theſe *Remedies* procure the Expectoration of purulent Matter; they conſolidate the inward Ulcers, reſtore the Functions of the *Viſcera*, promote the Urine, and carry off the Obſtructions of the *Viſcera*. Of the *Leaves* of *Betony* is made a Plaiſter, and particularly thoſe of the Head. The *Roots* have not the ſame Virtues.

Brunella *major*, *Folio non Diſſecto*, *Brunelle*; *Bauhin* miſtakes *Prunela Bugle* for the *Brunelle*; its Leaves are like to thoſe of ſweet *Baſilick*, it changes the blue Paper, it has the Herb Taſte, ſtiptick, and a little bitter; whence it is conjectured that the Acidity of the natural Salt of the Earth has diſembarraſſed itſelf in that *Plant* of Part of its Acrimony, and that being mixed with much Earth and Sulphur, it has produced a Kind of aluminous Salt. This Mixture of Principles renders the *Brunella* vulnerary, aſtringent, and deterſive. In enters into the Arquebuſade-Water, and into vulnerary Juleps. *Bauhin* eſteems its Lotion very proper for Wounds made with Fire-Arms; 'tis ordered in Diet-Drink, and in Apozems for the Spitting of Blood; for Urines tinged with Blood, for the immoderate Flux of *Menſes*, and for a Bloody-Flux, and for all Sorts of Hemorrhages. 'Tis uſed in Injection for deep Wounds, and in Clyſters in the Bloody-Flux.

Bryonia *Aſpera*, *ſive Alba*, *Baccis Rubris*, *Bryony*, *Hip*, *White Vine*, in *French*, *Coleuvree*, *Vigne Blanche*. The Leaves of this *Plant* are inſipid, glutinous, and do not change the blue Paper; the Root changes it much, 'tis bitter, and of a bad Smell; whence 'tis conjectured that the Acid of ammoniack Salt, which is predominant in that *Plant*, is more unfolded in the Root than in the Leaves, where it is wrapp'd up in a great deal of Sulphur. By the Analyſis theſe Roots give a great deal of acid Liquor, and a conſiderable Quantity of concreted volatile Salt. The Root, Tops, and Seeds of *Bryony*, are a ſtrong Purgative, and carry off the moſt obſtinate Obſtructions; therefore this *Plant* is of great Service in the Dropſy, Gout, Epilepſy, Aſthma; in the Vapours, Palſy, Vertiges, and in the moſt tedious Maladies. The Root is given in Powder, from one Scruple to two; the Juice is given to drink, from a Drachm to half an Ounce; and the Decoction from half an Ounce to an Ounce, and an Ounce and a half. But in whatever Manner this Root is uſed, it muſt be corrected with Cream of Tartar, or vegetal Salt.

Buglossum *Anguſtifolium majus*, *Bugloſſe*, in *French Bugloſe*. *Tragus* gives a very good Figure of this *Plant*. Its Roots are glutinous, and changes much the blue Paper, the Flowers change it a little, and the Leaves very little or not at all; whence we conjecture that the Ammoniack Salt is wrapt up in a glutinous Juice, where the Earth and Sulphur are predominant. The *Bugloſſe* cools, and eaſes the Melancholick. 'Tis proper to diſſipate the Fluxions of the Breaſt, and obſtinate Coughs. Its Juice is taken from three Ounces to ſix; the Diet-Drink in large Glaſſes. This *Plant* reſtores the Motion of the Blood in cooling it, and facilitates its Circulation. The Flowers are uſed, as in the Manner of Tea; they are ptepared into Conſerve; they are ranked among the Cardiac Flowers.

Bugula, *Bugle*; This *Plant* is bitter, deterſive, and changes a little the blue Paper. 'Tis employed in vulnerary Juleps, Diet-Drink, and Apozems, ordered for the Spitting of Blood, the Bloody-Flux, the white Flowers, ſore Throat, Ulcers, and for the Aphtha in the Mouth. The Juice of *Bugle*, clarified, has the ſame Virtues. 'Tis uſed in Plaiſters. It contains ſome ammoniack Salt wrapp'd up in Sulphur.

Bursa, *Paſtoris major*, *Folio Sinuato*, the *Shepherds-Purſe*, or *Pouch*, in *French*, *Mallet a Berger*, or *Tabouret*; it taſtes a little Salt, and is deterſive; the Juice of theſe Leaves changes a little the blue Paper; whence 'tis conjectured, that in that *Plant* the Ammoniack Salt, which is in the natural Salt of the Earth, predominates the other Principles. This Ammoniack Salt is diſſolved into a conſiderable Portion of Phlegm, and is temperated by much Earth and little Sulphur. This *Plant* gives no Acid by the chymical Analyſis, and all extracted from it is almoſt Alkaly. Very few *Plants* give ſo much concreted volatile Salt, more Lixivial fixed, and more Earth. Theſe Principles mixed render the *Burſa* proper to melt the Blood, when too much thickened by heterogeneous Acids, which obſtruct the Circulation. The Juice of its Leaves drank from four Ounces to ſix, is of a great Help in Loſſes of Blood, and even in Fluxions, accompanied with Inflammation. Its Water diſtilled has little or no Virtue, 'tis only the Phlegm ſeparated from the other Principles. This *Plant* is found during the whole Year, becauſe it ſows itſelf towards the End of the Summer.

Buscus *Arboreſcens*, *Box-Tree*, or *Box-Wood*, in *French*, *Bouis*, or *Buis*. *Ceſalpinus*, *Bauhinus*, and Mr. *Ray*, have imagined, that the Fruit of this *Plant* ſucceeded to the Flower; but *Tournefort* ſays that they grow in different Places, though on the ſame Stem. The Leaves of *Box* are bitter, of an ungrateful Smell, and change but little the blue Paper. From the Wood of this Tree are extracted an acid Spirit, and a fetid Oil. *Quercetanus* eſteems much this Oil for the Epilepſy, for the Vapours, and for the Tooth-ach; rarified and circulated afterwards, 'tis very ſweetning and aperitive. The Doſe is 15 or 20 Drops, mixed with Sugar; when not rectified, 'tis mixed with melted Butter, to greaſe the Cancer.

Calamintha, *Humilior*, *Folio rotundiori*, *Ground-Ivy*, in *French*, *Lierre Terreſtre*. *Cardus* has deſcribed this *Plant* under the Name of *Chamæcluna*. Its Leaves are very bitter, a little Aromatick, and ſcarce change the blue Paper. By the Analyſis this *Plant* gives no concrete volatile Salt, but a ſmall Quantity of urinous Spirit; all the reſt is Acid, Alkaly, Oil, and Earth; and theſe two laſt Parts are found, in it, in a reaſonable Quantity. The *Ground-Ivy* is very aperitive, deterſive, and vulnerary. *Camerarius* and *Ceſalpinus* eſteem it much to provoke the Urine, and force the *Calculus*. *Lobel* uſed it, in the Gout, by Way of Prevention.

Caltha *Arvenſis*, *Wild Marygold*, in *French Sany Sauvage*. The Leaves of *Wild Marygold* are ſtinking, bitter, and, burned at the Candle, make a Sort of Detonation, like to that of Nitre; which makes one believe that the natural Salt of the Earth is paſſed into it without any other Mutation than that of being united with a great deal of ſtinking Sulphur, and a great deal of Earth. Some prefer the Uſe of *Wild*

Wild Marygold to that of *Garden Marygold.* The Juice of this Plant is given from one Ounce to four. The Infuſion of the *Leaves* and *Flowers* in White Wine, is taken from three Ounces to ſix; the Extract and Conſerve from one Drachm to two. All theſe Preparations are very good for the Jaundice, the Palſy, Dropſy, Small-Pox, malignant Fevers, and for the Green-Sickneſs.

CAMPANULLA, *vulgatior, foliis urticæ, vel major, & aſperior.* *Tragus* ſays, that the Stalks of this Plant are ſquare, but *Tournefort* repreſents them angulous. *Ceſalpinus, Dodoneus,* and almoſt all Authors, aſſure us, that it is vulnerary, and proper to cure the Ulcers and Tumours in the Throat; whence call'd *Cervicaria & uvularia.*

CAPRIFOLIUM, *Germanicum Dodon, Wood-bine,* or *Honey-ſuckle,* in *French Chevre-feuille.* The *Leaves* of this Plant are inſipid, ſtiptick, and change a little the blue Paper; the *Root* changes it more: The *Bark* is acerb, ſalt, and ſtiptick. The Salt of the *Wood-bine* approaches near *Sal Ammoniac,* but is mix'd with fetid Oil and Earth. The Decoction of the *Leaves* is *vulnerary* and *deterſive,* proper for ſore Throats, and Wounds in the Legs. The *Leaves* pounded cure the *cutaneous Maladies.* The Water diſtill'd from the *Flowers* appeaſes the Inflammation of the Eyes, and ſtrengthens Women in Labour; to whom three Ounces of that Water is adminiſter'd, with an Ounce of Water of Orange-flowers.

CARDUUS STELLATUS, *Starry Thiſtle,* in *French Chardon Etoillé.* We have no good Figure of this Plant. *Its Leaves* are very bitter, and the *Root* taſtes of *Artichoke.* It contains a Salt which approaches very near the natural Salt of the Earth; for its Solution is very bitter, and loaded with *Sal Ammoniac* and *Nitre.* The *Carduus* is *febrifuge, vulnerary,* and *aperitive.* In an *intermittent Fever* five or ſix Ounces of the Juice of this Plant is given at the Beginning of the Paroxiſm. The ſame Juice carries off the Spots in the Eyes, and cures the Wounds. M. *De Lamoignon,* Intendant of *Languedoc* in *France,* has communicated to the Publick a *Remedy* which had cur'd him of a violent *Nephritick*; which *Remedy* is as follows:

The 28th Day of the Moon, in every Month, the Patient muſt drink early in the Morning a large Glaſs full of very good White Wine, in which has been macerated a Drachm of the firſt Bark of the Root of *Carduus,* gather'd toward the End of *September,* and dry'd from the Sun, and powder'd very fine. This Bark is a very ſmall and thin Skin, brown outwardly, and white inwardly. The Day this *Remedy* has been taken, muſt be put towards the Evening into Half a Pint of Water, a Handful of Parietary, a Drachm of Saſſafras, as much Anniſeed, and Half a Drachm of Cinnamon, in Powder: The whole is boil'd on a clear Fire for the Space of half a Quarter of an Hour. The Veſſel is taken off the Fire, and plac'd, cloſely cover'd, on the hot Embers; the next Day 'tis put again on a clear Fire, that it may boil for another half Quarter of an Hour; after which, the Liquor is pour'd over two Ounces of powder'd Sugar-candy put into a Porrenger, or other ſuch Veſſel; the Infuſion ſtrain'd through a Linnen Cloth, with Expreſſion of the Ground. When the Sugar is melted, the Patient drinks it as hot as he can, and muſt take nothing elſe for three Hours after, no more than when he has took the firſt *Remedy.*

CARYOPHILLATA, *vulgaris, Wicker,* or *Oſier Rod,* in *French Herbe benoite,* or *Reciſe.* The *Flowers* of this Plant are of five *Leaves*; it is bitter, ſtiptick, and changes much the blue Paper. Its *Root* ſmells of Cloves; its Salt approaches near *Sal Ammoniac,* but is much loaded with Acid, and wrapp'd up in much of eſſential Oil and Earth. The Wine wherein the *Root* has been macerated, is *vulnerary,* and *deterſive.* The Extract of the Plant has the ſame Virtues; 'tis preſcrib'd in Rheumatiſms.

CENTAURIUM, *minus, flore purpureo, Centory;* in *French Centaurée,* or *Fiel de Terre.* M. *Tournefort* ſays, that the Figure *Matthiolus* gives us of this Plant is excellent. Its *Leaves* and *Flowers* are of an exceſſive Bitterneſs, and nevertheleſs change much the blue Paper; which makes us believe that its Salt is not very different from the natural Salt of the Earth, which is very bitter: There is even ſome Appearance that the Salt of *Centory* is mix'd with a conſiderable Portion of Sulphur and Earth; but in ſuch a Manner, that the *Sal Ammoniac* is more diſengag'd than the other Principles. 'Tis not then ſurprizing if the *Centory* be *febrifuge, laxative,* and *aperitive,* kills the Worms, and reſtores the natural Functions. A Handful of the Summits, or Tops of this Plant, is macerated into a Glaſs of White Wine; but as the Infuſion is very bitter, 'tis better to make the Extract of *Centory,* and to give a Drachm of it, or to mix it with as much Kinkina, in Powder, eſpecially in *intermittent Fevers,* when there are Obſtructions in the *Viſcera*; for then the Patient is cur'd without Fear of a Return. The Infuſion, or Decoction of *Centory,* is *vulnerary, deterſive,* and *reſolutive,* when apply'd outwardly.

CHAMÆDRIS *minor, repens, Germander*; in *French Germandrée.* The *Leaves* of the *Germander* are bitter and aromatick, and do not change the blue Paper; which ſhews that it contains Principles different from thoſe of the *Centorie.* Its Salt does not differ from the natural Salt of the Earth, which is a Mixture of Sea Salt, Nitre, and *Sal Ammoniac.* 'Tis acerb, very bitter, and very aperitive. There is an Appearance that that found in this Plant has loſt its Acrimony by the Mixture of a great deal of eſſential Oil, which renders the *Germander* aromatick. 'Tis *febrifuge, ſtomachick, aperitive,* and *diaphoretick.* A Handful of its *Leaves* are macerated for a whole Night, from the Fire, in a Glaſs of Wine, together with a Drachm of vegetable Salt, which muſt be drank faſting, for the Green-Sickneſs. A Drachm of the Extract made with its *Leaves* and *Flowers,* with two Drops of Oil of Cinnamon, is preſcrib'd for the ſame Malady; its *Leaves* are uſed in Infuſion, in the Manner of thoſe of Tea, for the Gout and Sciatica.

CHAMÆMELUM, *vulgare Leachantemum, Camomile,* in *French Camomille.* This Plant is bitter, aromatick, and changes much the blue Paper. It ſeems that it contains a *Sal Ammoniac* loaded with a great deal of Acid, and wrapp'd up in a great Quantity of Sulphur and Earth. The *Camomile* is *aperitive, diuretick,* and *febrifuge.* In *Dioſcorides*'s Time, the Powder of *Camomile Flowers* was uſed in *intermittent Fevers.* *Rivierus* preſcribes it on the ſame Occaſion. The Infuſion of the Summits, or Tops of *Camomile,* and of Melilot, give Eaſe to thoſe troubled with the *Nephritick,* and with a *Retention* of *Urine.* It appeaſes the Gripes, which often happen after a Delivery. *Pauli* prizes much the Wine in which *Camomile Flowers* have been macerated, for the Pleuriſy; but there muſt be applied, at the ſame Time, on the Part where the Pain is felt, Bladders fill'd with the Decoction of the ſame Plant, heating the Decoction, from Time to Time. 'Tis employ'd likewiſe in Clyſters, Fomentations, Cataplaſms, and in the half Baths, for the Gout, Sciatica, and Hemorrhoids, or Piles. Its Oil is very uſeful on the ſame Occaſion. For the Rheumatiſm 'tis mix'd with equal Parts of Oil of *St. John's-wort,* and of camphorated Spirit of Wine, for a Liniment, cover'd afterwards with a hot Cloth.

CHELIDONIUM, *majus vulgare, Celandine,* in *French Chelidoine, Eclaire.* *Dioſcorides* relates, that it was believ'd, in his Time, that the Swallows uſed to reſtore the Sight to their young, after they had been made blind, by the Application of this Herb. *Ariſtotle* believ'd it, but *Celſus* has very juſtly refuted that Error. The *Celandine* is bitter, acerb, and burning, eſpecially the Root, which gives more Orange-colour'd Juice than the other Parts of the Plant. It changes but very little the blue Paper, and ſmells like rotten Eggs; which makes me believe that its Juice is, as it were, phagenedical, ſemblable in ſome Man-

ner to the Liquor which results from a Mixture of Solution of corrosive Sublimate, and of Lime-water. The *Celandine*, by the Analysis, gives enough of that Salt fix'd, as well as volatile; but 'tis wrapp'd up in a great deal of Sulphur and Earth. This Plant taken inwardly, is very *aperitive*; for the Dropsy, an Ounce of its Root, and Half an Ounce of Tincture of *Mars*, are infus'd, or macerated, during four and twenty Hours, in a Pint of White Wine; the Infusion is strain'd through a Cloth, two Ounces of which are taken twice a Day. The following Preparation is very good for the Vapours, and for the Consumption. There must be put in Digestion, during eight Days, twelve Pounds of the whole Plant slightly pounded, three Dozen of Craw-fishes cut in Pieces, and two Pounds of Honey; then the Alembick must be luted, and the Matters contain'd in it distill'd in *Balneo mariæ*. The distill'd Water is very good for the Vapours drank from two Ounces to four. It carries off the Inflammation of the Eyes, and dries up the Ulceries of those Parts. The Herbs pounded cure the Wounds of Horses.

CICHORIUM, *silvestre*, *Succory*; in *French Chicorée Sauvage*. The Roots and Leaves of this Plant are very bitter, full of Milk, and change a little the blue Paper; the Flowers change it more, are less bitter, and of a glutinous Taste. The Salt which is in the Succory does not seem to be very different from the natural Salt of the Earth, but is join'd with a considerable Portion of Sulphur and terrestrial Particles. This Plant analysed gives a great deal of Oil and Earth, some acid Liquors, a small Quantity of urinous Spirit, and of concrete volatile Salt. The Roots and Leaves of Succory are aperitive, diuretick, and cooling. There is Appearance that they do not cool but by carrying off the Obstructions. The Leaves and Roots are prescrib'd in Broths, Diet-Drinks, Apozems, and Clysters. The Juice of *Succory* helps the Expectoration, or Spitting, in Fluxions of the Breast. The Extract has the same Virtues, and purifies the Blood. The Syrup, simple and compos'd, is a very good Desopilative, especially when mix'd with two Drachms, or Half an Ounce of Tincture of *Mars*. The Conserve of the Flowers is employ'd for the same Uses, in Bolus's, and in aperitive Opiates. These Opiates are of Service in the Cachexy, Dropsy, and hypochondriacal Affections; in intermittent Fevers, the Gout, and the excessive Heat of the Abdomen.

CICUTA, *major*, an Herb much like our *Hemlock*, in *French Cigue*. This Plant has a salt Taste, it smells of fetid Oil, and changes but very little the blue Paper; which is a Sign that it contains a Salt like the *Sal Ammoniac*, wrapp'd up in a great deal of Oil and Earth. Its Principles are very near found in *Opium*. The Leaves of this Plant are resolutive; boil'd in Milk they are applied, with great Success, on the Hemorrhoides, or Piles; and on the Parts where the Gout is felt. The Cataplasm of its Leaves pounded with Snails, and mix'd with the four resolutive *Farinæ*, is excellent for the Inflammation of the *Scrotum*, for the Gout, and for the *Sciatica*. The *Hemlock* is employ'd in the *Diabotanum* of M. *Blondel*, which is a very good Plaister to resolve all the scrophulous Tumours.

CLYMENUM, *Parisiense flore Cæruleo*. *Bauhin* has confounded this Plant with the *Lathyrus latifolius Pin*. This has but two very large Leaves on each Pedicle; whereas the Species we speak of has two or three Pair on the same Pedicle; and those Leaves are but three or four Lines broad, and very near an Inch and a half long. Its Flowers are also a great deal smaller than those of the *Lathyrus latifolius*. Mr. *Ray* speaks of it under the *Lathyrus viciformis*.

COFFEE, is the Fruit of a Plant very common in *Arabia Felix*. That of the *Levant* is most esteem'd, being greener, heavier, and appearing riper than that from *Mocha*, which is larger, lighter, and whiter.

This is what *Dominicus de Farcy*, Doctor in Physick of the Faculty of *Paris*, says of *Coffee*, in a Thesis held in the College of Physicians of that Metropolis, *Anno* 1695. *Volatile Sal, quo turget semen* CAFE, *Spiritus agitat, quorum pernicitas, vigiliam incebit; aduste præterea particulæ, quarum in Cafe magna quantitas, olfactu gustuque Judicibus, insinuantque in sanguinem, primo, tum in Nerveum laticem, quibus per in concinnitatem suæ figuræ, per assiduæ mobilitatis importunitatem, stimulos addunt efficaces, unde spiritus ad solita munia, reseratis cerebri ductibus, excitentur. Ab eorundem salium abundantia, cruor intra pulmones implicatus visco; bronchiorum vesiculæ sordibus irritite, vindicantur in Libertatem; portio tandem non exigua sanguinis solvitur in Serum, quod renum cribro purgatum, illabitur in vesicam*, i. e. The volatile Salt with which the *Coffee* Berry abounds, agitates the Spirits, whose Velocity hinders Sleep; besides the adust Particles, of which there is a great Quantity in the *Coffee*, as we may judge by the Smell and Taste, insinuate themselves first into the Blood, then into the Texture of the Nerves, to which, by the Disproportion of their Figure, and their continual Motion, they add a Stimulation; whence the Spirits are forwarded in the latent Ducts of the Brain, in their usual Operations. From the abundance of these Salts the Blood is freed from the viscous Humour 'tis wrapp'd up in within the Substance of the Lungs, as well as the Bruncia, of their Sordes. However, a considerable Quantity of the Blood is resolv'd into a Serosity, which being filtrated through the Reins, fall into the Bladder.

Coffee produces these Effects, particularly with People of a pretty corpulent Habit; being found hurtful to those who are thin, lean, dry, and of a bilious Temperament, as it dries up the Nerves, and inclines them to Tremors. It is said to be prejudicial, likewise, to those who digest too fast, where the Circulation is too quick, or where there is a spitting of Blood arising from the Mouths of any of the Veins, and Arteries being too open, or the Blood too thin and sharp.

The oily Matter which separates from the *Coffee*, and appears on its Surface when roasted, and its particular Smell which distinguishes it from Pease, Beans, Rye, *&c.* which some substitute in lieu of *Coffee*, are to be the real Indications of its Effects. If consider'd with Regard to the Oil drawn with the Retort, this, as well as that, contains volatile Principles, as we have already observ'd, both saline and sulphurous. It is to the Dissolution of its Salt, and the Mixture of its Sulphur in the Blood, that its chief Faculty of promoting Watchfulness is to be attributed; hence also its Property of promoting Digestion, of precipitating Foods, of preventing Eructations, and correcting Acrimonies of the Stomach, when taken after Meals. Hence also that Fermentation in the Blood serviceable to corpulent People; hence also its diuretick Virtue. By Experience it is found of Service to drink a Glass of Water before *Coffee*, to render it laxative; to mix it with Milk, or Cream, to extinguish its Sulphur, embarrass its saline Principles, and render it nourishing.

Simon Pauli maintains, that it enervates Men, and renders them incapable of Generation; and it is certain the *Turks* attribute the same Effects to it; and from the immoderate Use hereof account for that Thinness of the Inhabitants found in Provinces formerly the best peopled: But this Opinion is refuted by *Du Four*. Father *Malbranche* gave the Royal Academy of Sciences an Account of a Person cur'd of an Apoplexy by means of several Clysters of *Coffee*.

The Tree that produces the *Coffee* is a kind of *Arabick* Jessamine; the Berry, when ripe, is as hard as Horn; which gave Occasion to an Opinion that the Inhabitants of the Kingdom of *Yemen*, in *Arabia Felix*, where it is cultivated, steep'd in boiling Water, or bak'd in a Furnace, all the *Coffee* they sold abroad, to prevent its growing any where else.

Its Original is not well known; some ascribe it to the Prior of a Monastery, who being inform'd by a Goatherd that his Cattle sometimes browzing on the Tree

Tree would wake and caper all Night; became curious to prove its Virtues: Accordingly, he firſt tried it on his Monks, to prevent their ſleeping at Mattins. Others from *Schehabeddin* refer the Invention of *Coffee* to the *Perſians*, from whom it was learn'd in the fifteenth Century by *Gemaloddin*, Mufti of *Aden*, a City near the Mouth of the Red Sea; and who having try'd its Virtues himſelf, and found that it diſſipated the Fumes which oppreſſed the Head, inſpir'd Joy, open'd the Bowels, and prevented Sleep, without being incommoded by it; recommended it firſt to his Derviſes, with whom he uſed to ſpend the Night in Prayer. This Example brought *Coffee* in Vogue at *Aden*; the Profeſſors of the Law, for Study; Artiſans, to work; Travellers, to walk in the Night; in fine, every Body at *Aden* drank *Coffee*. Hence it paſſed to *Mecca*, where firſt the Devotees, then the reſt of the People took it. From *Arabia Felix* it paſſed to *Cairo*.

In 1511. *Khaic Beg* prohibited it, from a Perſuaſion that it inebriated, and that it inclin'd to Things forbidden; but Sultan *Cauſſou* immediately after took off the Prohibition, and *Coffee* advanc'd from *Egypt* to *Syria* and *Conſtantinople*. The Derviſes declaim'd againſt it from the *Alcoran*, which declares that Coal is not of the Number of Things created by God for Food. Accordingly, the Mufti order'd the *Coffee-Houſes* to be ſhut; but his Succeſſor declaring *Coffee* not to be Coal, they were open'd again.

During the War in *Candia*, the Aſſemblies of Newsmongers making too free with State-Affairs, the Grand Vizier *Cuproli* ſuppreſſed the *Coffee-Houſes* at *Conſtantinople*; which Suppreſſion, though ſtill on Foot, does not prevent the publick Uſe of the Liquor there. *Thevenot* the Traveller was the firſt who brought it into *France*; and a *Greek* Servant, call'd *Paſqua*, brought into *England* by M. *Dan. Edwards*, a *Turkey* Merchant, in 1652, to make his *Coffee*, firſt ſet up the Profeſſion of *Coffee-man*, and introduc'd the Drink among us; though ſome ſay Dr. *Harvey* had uſed it before.

The *Mahometans* diſtinguiſh three Kinds of *Cahuah*; the firſt is Wine, or any Liquor that inebriates; the ſecond is made of the Pods that contain the *Coffee-Berry*; this they call the *Sultana's Coffee*, from their having firſt introduc'd it, on Account of its heating leſs than the Berry, as well as its keeping the Bowels open; the third is that made with the Berry it ſelf, which alone is uſed in *Europe*, the Pods being found improper for Tranſportation. Some *Europeans*, who imported the Pods, call'd them the *Flower of the Coffee Tree*.

The Preparation of *Coffee* conſiſts in roaſting, or giving it a juſt Degree of Torrefaction, on an earthen or metalline Plate, till it has acquir'd a browniſh Hue, equally deep on all Sides; it is then ground in a Mill, as much as ſerves the preſent Occaſion; a proper Quantity of Water is next boil'd, and the ground *Coffee* put in it; after it has juſt boil'd, it is taken from the Fire, and the Decoction having ſtood a while to ſettle and fine, they pour and decant it into Diſhes.

The Cuſtom is to drink *Coffee* as hot as poſſible, with Sugar; though the *Turks* do not trouble themſelves to take off its Bitterneſs with any Sugar. Their Grandees add to each Diſh a Drop of Eſſence of Amber; others boil it with a Couple of Cloves; others with a little *Indian* Aniſe; others with Cacouleh, or the Grain of the *Cardamum minus*. *Coffee* is one of the Neceſſaries which the *Turks* are oblig'd to furniſh their Wives with.

It is ſaid it yields a Revenue of upwards of five Millions *per Annum*; nor will that appear any Wonder, when we conſider that in *London* alone, beſides the Conſumption in private Houſes, ſome have computed 3000 *Coffee-Houſes*. In the three Kingdoms are yearly expended 100 Tuns of *Coffee Berries*; in *England* alone 70; which at 300 *l. per* Tun, a moderate Price, amounts to 21000 Pounds Sterling.

CORAL is a Production of the Sea, uſually rank'd among the Number of *Marine Plants*; though the Antients took it, without Heſitation, for a Stone; moſt of the Moderns hold it a Vegetable; of late Days one maintains it partly a Plant, partly Stone; while another curious and able Naturaliſt, who has much ſtudied the Production of the Sea, almoſt ranks it in the Number of Animals; as imagining it the Work of certain Sea Inſects. This Opinion is now ſo well eſtabliſh'd, that all other Sentiments ſeem almoſt precluded. Father *Kircher* ſuppoſes entire Foreſts of it at the Bottom of the Sea; and M. *Tournefort*, that able *Botaniſt*, maintains, that it evidently multiplies by Seed, though neither its Flower nor Seed be known. However, the Count *De Marſigli* has diſcover'd ſome Parts therein which ſeem to ſerve the Purpoſe of Seeds and Flowers.

Coral, then, being eſtabliſh'd a Plant, has, in that Quality, Roots, wherewith it is faſten'd to the Rock wherein it grows: Theſe Roots are cover'd with a Bark beſet with ſtarry Pores, which traverſe them from Top to Bottom. Above the Root is the ligneous, or woody Part of the Plant, if we may call a Subſtance ſo, that rather ſeems to reſemble Stone than Wood. It is divided into Branches like other Plants, having white Streaks therein, which ſeem to repreſent a kind of Fibres. The Extremities of the Plant are ſoft, and rounded with little Bowls, ordinarily divided into ſix Cells, fill'd with a Humour ſomewhat like Milk, fatty, ſharp, and aſtringent. Laſtly, that nothing may be wanting to conſtitute a real Tree, theſe Bowls are eſteem'd a kind of Pods, or *Capſulæ*, containing the Seed of the *Coral*; it is even ſaid, that in what Place, or on what Matter ſoever this Juice be ſhed, it carries Fecundity with it, and produces a Plant of *Coral*; whence it is that in the Cabinets of the Curious we find ſome of it on dead Men's Skulls, Pieces of earthen Ware, and other Kinds of ſolid Bodies, which Chance, and the working of the Sea, have thrown into ſome of Father *Kircher*'s Foreſts. *Coral*, the Count *De Marſigli* obſerves, grows chiefly in Grotto's, whoſe Mouth or Aperture is towards the South, and their Vault, or concave Arch, nearly parallel to the Surface of the Earth. For its Growth, it is neceſſary the Sea be as quiet as a Pond: It vegetates the contrary Way to all other Plants; its Foot adhering to the Top of the Grotto, and its Branches ſhooting downwards. The Foot takes the exact Form of the Solid it grows to, and even covers it like a Plate, to a certain Extent; which Monſieur *De Marſigli* thinks a Proof that its Subſtance was originally fluid: And what confirms the Thought is, that the ſame Subſtance ſhall ſometimes line the Inſide of a Shell, which it could never have enter'd but in Form of a Fluid.

Upon a nice Examen of the ſeveral Parts of *Coral*, M. *De Marſigli* gathers, that all its Organiſm, with Regard to Vegetation, conſiſts in its Rind; that the Tubules of this Rind filtrate a Juice which fills the Cellules, and runs along the Canals as far as the Extremities of the Branches, and that this Juice being petrified, both in the Cells encompaſſing the *Coralline* Subſtance, and in thoſe of the Extremities of the Branches, whoſe Subſtance is not yet form'd, makes the Plant grow, both in Height and Bulk.

The Antients believ'd that the *Coral* was ſoft while it continu'd at the Bottom of the Water; and that it only became hard and ſolid by the Impreſſion of the Air; but the Moderns are convinced of the contrary from Experience, and know that there was more of Imagination than Truth in the Name *Gorgonium*, which they gave it to ſhew that *Meduſa*'s Head did not convert Objects into Stone, more ſurely than *Coral* became petrified as ſoon as it appear'd in the Air.

There are properly but three Kinds of *Coral*, *red*, *white*, and *black*: The white is the rareſt and moſt eſteemed; but it is the red is ordinarily uſed in Medicine. It muſt be choſen thick, ſmooth, and ſhining, and of a beautiful red, not covered with any Tartarous Matter. There is a Kind of *white Coral* pierced full of Holes; and a *black Coral*, named *Antipates*; appearing of a different Nature from the reſt; but theſe are of no Uſe. The Chymiſts draw a Magi-

Magiſterial Tincture from *Coral*, and a Salt. It gives Title to an officinal Compoſition, called Syrup of *Coral*, ſometimes preſcribed by Phyſicians; as is likewiſe the Powder of *Coral*, finely ground, and afterwards levigated on a Marble, and made up into a proper Form; but there are few, except thoſe who are fond of Medicines, with Pearls in them that make uſe hereof; by means of its exceeding Hardneſs, it is ſuſpected to take away with it a great deal of the levigating Stone.

The Virtues attributed to *Coral*, and its Preparations are, that it is Cardiack, and therefore of Uſe in Diarrhœas, too large Fluxes of the *Menſtrua*, and Flooding; of Service in the *Fluor albus*, and to prevent Miſcarriages; beſides its Uſe in common as a teſtaceous Powder, in Children's Diſeaſes, *&c.* Some alſo attribute to *Coral* the immediate ſtopping of Blood; the ſecuring of Houſes from Thunder-bolts; the keeping away of evil Spirits, and the promoting of Dentition. It is added that *Coral* appears redder wore on a Man than on a Woman; that it becomes pale and livid, when worn by a ſick Perſon; and that the Changes in the *Plant* correſpond with thoſe in the Diſeaſe. But theſe Fancies, and many more of the ſame Kind, are not at all founded on Experience. Its chief and only Uſe is in Chaplets, Beads, and other Toys.

The Time for gathering this *Plant* (for we muſt continue to ſpeak like *Botaniſts*) is from *April* to *July*; the Places are the *Perſian Gulf*, *Red Sea*, Coaſt of *Africa*, towards the Baſtion of *France*; the Iſles of *Majorca* and *Corſica*; and the Coaſt of *Provence* and *Catalonia*. The Method of gathering *Coral*, is nearly the ſame in all Places; that uſed at the Baſtion of *France*, where there is an eſtabliſhed Fiſhery, under the Direction of a Company at *Marſeilles*, is as follows.

Seven or eight Men go in a Boat, commanded by the Patron or Proprietor; the Caſter throws his Net, if we may ſo call the Machine wherewith he uſes to tear up the *Coral* from the Bottom of the Sea; and the other ſix manage the Boat. The Net is compoſed of two Beams tied a-Croſs, with a leaden Weight, to preſs them down: To the Beam is faſtened a great Quantity of Hemp looſely twiſted round, among which they mix ſome ſtrong Nets. In this Condition the Machine is let down into the Sea; and when the *Coral* is pretty ſtrongly embarraſſed, in the Hemp, and the Net, they draw it out by a Rope; which they unwind according to the Depth, and which ſometimes requires half a Dozen Boats to draw; if the Rope happen to break, the Fiſhermen are in great Danger of Drowning. Before the Fiſhermen go out, they agree on the Price of the *Coral*, which is ordinarily, at the Rate of *4 s. 6 d. per lb.* When the Fiſhery is over, which in a Seaſon uſually amounts to 25 Quintals of *Coral*, each Boat; it is divided into 13 Parts; the Patron whereof, or Maſter-*Coraller*, has four, the Caſter two, and each of the ſix Companions one, the 13th being reſerved for the Company, *&c.*

Carnus *Hortenſis*, the *Dog-Tree*, in *French Carnouiller*. The Flowers of *Carnouiller* are of four Leaves, and ſometimes of five. The Leaves are very bitter, the Fruit ſour, ſtiptick, and changes the blue Paper as much as Alum does it; whence 'tis concluded that the Fruit contains a Salt analogous to it; therefore it is not ſurpriſing if *Hippocrates*, *Dioſcorides*, and *Pliny* have judged this Fruit proper to ſtop Diarrhœas. *Ruel* ſays, That for that Malady 'tis preſerved in Bottles, filled with Honey and Syrup. For the Bloody-Flux, and to excite the Appetite, an Electuary is prepared of the Pulp of the Fruit of *Carnus*.

Cascuta *Minor*, a Kind of *Bindweed*; in *French* called *Caſcute*. The *Caſcute* is found, almoſt, on all *Plants*; it cannot live without their Succours; for its Roots periſh ſometimes after the Seed has riſen; and then that *Plant* which is nothing elſe but a Bunch of reddiſh Hairs, which nouriſhes itſelf by running round the neighbouring *Plants*; thoſe Hairs not only embarraſs them, by ſmall *Mamemlons*, rang'd in Form of Beads, but penetrate, by their Points, into the Pores of the Bark, break the Texture of their Veſſels, and receive the nutritious Juice. Each Flower of the *Cuſcute* is of very near two Lines perforated at the Bottom, divided into four or five Points, and garniſhed with ſome very ſhort *Stamina*, with yellow Tops. The Calyx is divided like the Flowers, and throws forth a *Piſtil*, which enters the Hole of the Flower, and becomes afterwards a membranous Fruit, almoſt round, with two or three Ribs. That Fruit is perforated at the Bottom, and placed on a little *Capſula*, which is at the Bottom of the *Calyx*, which wraps up the Bottom of the ſame Fruit it contains; it contains ſome ſmall brown Seeds. The *Cuſcute* of theſe Countries is not uſed in Medicine. That brought from the *Levant*, under the Name of *Epithim* of *Venice*, is not purgative. 'Tis rather Cardiack and Aperitive.

Cynoglossum *Vulgare Majus*, *Dog's-Tongue*; in *French*, *Langue de Chien*. The Leaves of this *Plant* are white and ſilky; its Flowers are, at firſt, purple, which become blue afterwards. The Bark of its Root is a little bitter, ſalt, ſtiptick, and glutinous; it changes the blue Paper. It appears that the *Sal. Ammoniack*, which is in the natural Salt of the Earth, is predominant in the *Cynogloſſum*, where it is temperated by much Phlegm, Earth, and fœtid Oil. Therefore its Root is proper to ſtop all Sorts of Fluxions, and ſweeten the Acrimony of the Humours. Its Leaves are vulnerary and deterſive.

Dens Leonis *Latiore Folio*; *Dent de Lion*. The Leaves of this *Plant* are very bitter, and change little the blue Paper. The Roots change it a great deal more, they are bitter, ſtiptick, deterſive. The whole *Plant* is aperitive, diuretick, vulnerary, and febrifuge. *Targus* preſcribes the Water of *Dent de Lion*, in the internal Inflammations. *Barbet* adviſes to take the Juice; it purifies the Blood by Urine, to appeaſe an exceſſive Cough, and cure a Cold; a Quarter of a Pint of Milk is drank at Night, with which is mixed, boiling hot, as much of the Decoction of *Dent de Lion*; adding to it a ſmall Quantity of Sugar candied. The Extract of this *Plant* is given from half a Drachm to a Drachm and a half.

Digitalis *Minima*; *Bell-Flower*, or *Fox-Glove*; in *French*, *Glatiole*. *Cordus* has took the Flower of the *Gratiol* for a Flower with five Leaves, though it be all of a-Piece. The *Fox-glove*, analyſed, gives no volatile Salt, but a great deal of acid Oil and Earth. *Pena* and *Lobel* aſſure us that this *Plant* is both a ſtrong Emetick and Cathartick. Therefore it is preſcribed in the Dropſy and Cachexy, to thoſe who have an intermitting Fever, or are ſubject to the Gout and Sciatica. *Camerarius* ſays, that the Extract of this *Plant* muſt be mixed with the Powder of *Cinnamon* in the Dropſy.

Echium *Vulgare*, *Wild Burrage*, or *Bugloſe*; in *French Viperine*, *Herbe aux Vipers*. Mr. *Ray*, and all the learned *Engliſh Botaniſts* agree, that *Lobel* has miſtook the *Echium*, with the *Lycopſis* of *Languedoc*.

Erica, *Vulgaris*, the *Sweet Broom*, or *Heath*; in *French Bruyere*, or *Petrole*. *Cluſius* and *Bauhin* have took the Flower of *Heath* for a Flower with five Leaves, though it be of a whole Piece; but its Calyx impoſes often for the Flower. The Decoction of *Bruyere* is Diuretick. *Tabernæmontanus* aſſures us, that the Fomentation of Flowers of *Heath* appeaſe the Pains of the Gout. For the ſame Diſtemper a vaporous Bath is prepared with the Leaves and Flowers of this *Plant*.

Eryngium *Vulgare*, a Kind of *Thiſtles*; in *French*, *Chardon Roland*. The Flowers of *Eryngium* are of five whitiſh Leaves. By the *Analyſis*, are extracted from this *Plant* a mediocre Quantity of concert volatile Salt, a great deal of Oil, and of Earth. Its Roots are aperitive and diuretick; they are employed in Diet-Drinks and Apozems, but there ſhould be added to it ſome Fruits of *Alkikengi*. The Water diſtilled from the *Eryngium* alone, or mixed with

with half of Walnut-Water, is a Febrifuge, and purifies the Blood.

EVONYMUS *Vulgaris*, the *Spine-tree*, or *Prick-Timber*, in *French*, *Bonnet de Preſtre*. 'Tis aſſured that the Fruit of this *Plant* is both Emetick and Cathartick; reduced into Powder, or by waſhing the Hairs with its Decoctions, it kills the Lice.

EUPATORIUM *Cannabinum*, a Kind of *Agrimony*; in *French Eupatoire*. The Juice of the Leaves of this *Plant*, or a Drachm of its Extract, and the Diet-Drinks prepared of it, drank by Glaſſes, are very proper to carry off the Obſtructions of the *Viſcera*, eſpecially thoſe which ſucceed to intermitting Fevers; the Uſe of its Leaves, in Infuſion, in the Manner of Tea, relieve the Dropſicals; it muſt be preſcribed after the Punction, or Tapping, and the Legs muſt be fomented with the Decoction. For the Green-Sickneſs, for the Itch, and all other cutaneous Diſtempers, 'tis mixed with the Fumiterre in Whey, or Diet-Drinks. The Summities loaded with Flowers are very vulnerary. The Roots are both Emetick and Cathartick.

EUPHRASIA *Oficinarum*, *Eye Bright*; in *French Euſ'raiſe*. It melts the Humours, and renders them proper to circulate, and to carry off the Matters which cauſe the Obſtructions. 'Tis a common Opinion that it clears, ſtrengthens, and even reſtores the Sight. The Powder is preſcribed from a Drachm to three, in a Glaſs of Fennel-Water. There might be a Conſerve made of it, or it muſt be mixed with that of Leaves of *Wormwood*.

FRAXINUS, an *Aſh-Tree*, in *French*, *Fréne*. The Leaves of this Tree, by the Analyſis, gives a great deal of acid Liquors, a ſmall Quantity of urinous Spirit, a great deal of Earth, and a mediocre Quantity of fixed Salt. Therefore this *Plant* is aperitive, diuretick, and ſudorifick. In the Small-Pox and Meaſles, *Simon Pauli* praiſes the Uſe of the Salt of *Aſh-Tree*, taken in the Water of *Carduus Benedictus*, mixed with ſome Syrrup of Raſberries. The Aſhes of the Bark of *Aſh-Tree* are a very good Cauſtick. *Lobel* ſays, that the Perfume of the Leaves, Bark, or Seeds of this Tree cures Deafneſs. 'Tis certain that this Perfume is reſolutive. The Bark of the Roots of *Aſh-Tree* is preſcribed for the Dropſy, Rheumatiſm, Sciatick, and for all Maladies, where all Superfluities are to be evacuated.

FUMARIA *Officinarum*, *& Dioſcoridis*, *Fumitory*; in *French Fumeterre*. This *Plant*, though very bitter, changes nevertheleſs the blue Paper; therefore, 'tis conjectured that it contains a Salt like the natural Salt of the Earth; but in which the *Sal-Ammoniack* predominates the nitre and marine Salt; beſides the Salt of *Fumitory* is joined with a great deal of Sulphur and Earth diſſolved in a conſiderable Quantity of Phlegm. By the Analyſis the Fumitory gives a great deal of concreted volatile Salt, a great deal of fixed Salt, very lixivial, and a great deal of a very thick Oil. All theſe Principles render this Plant laxative, diuretick, proper to purify the Blood, and for the Deſopilation of the Parts. 'Tis eſteemed a Specifick in all cutaneous Diſtempers; in the Hypochondriacal Melancholy; in the Cachexy and Dropſy. Its Juice is adminiſter'd from two Ounces to ſix. The Infuſion in Whey from ſix Ounces to ten or twelve. The diſtilled Water from a Glaſs to two. The ſimple Syrup, two or three Ounces in a Diet-Drink; the compoſed Syrup from one Ounce to two, if the Patient is to be purged. The Water of *Fumitory* is alſo deterſive, and proper to dry the Ulcers of the Mouth.

GERANIUM, *Storkſbill*; in *French*, *Herb a Robert*. This *Plant* is ſtiptick, ſalt, and ſoweriſh, it ſmells of *Bitumen*, and changes the blue Paper. There is ſome Appearance that it contains a Salt like the Alum, mixed with a ſmall Quantity of fœtid Oil, and a very little of *Sal-Armoniack*. By the Analyſis it gives a great deal of Acid, very little of Oil, no concreted volatile Salt, but a ſmall Quantity of urinous Spirit. The *Geranium* is very aſtringent, and very vulnerary; the Wine wherein the Leaves bruiſed have macerated for a whole Night, ſtops all Sort of Hemorrhages.

GRAMEN *caninum arvenſe*, in *French Chiendent*. The Roots of *Chiendent* are of great Uſe in all Diet-Drinks. 'Tis aſſur'd, that the Water diſtill'd from it kills the Worms. The Roots are aperitive, but temperate, and unſtop the *Viſcera*, without cauſing any Accident. By the Analyſis they give a great deal of Oil, Earth, and ſeveral acid Liquors, with a ſmall Quantity of fix'd Salt, and no volatile.

HERBA PARIS. *Sardus* and *Ceſalpinus* have aſſur'd, that the *Herba Paris* is very good for the *Mania*. The firſt preſcrib'd Half a Spoonful of the Powder of this Herb taken faſting, for twenty Days ſucceſſively. *Tragus* ſays, that the *Herba Paris* pounded, and applied in Cataplaſms, appeaſe the Inflammation, and reſolve the Tumours of the *Scrotum*. 'Tis a ſovereign *Remedy* for the *Panaris*, or Whitlow. The Water diſtill'd from this Plant cures the Inflammation of the Eyes.

HYOSCYAMUS *vulgaris*, *Henbane*, or *Juſquiame*. The *Leaves* of this Plant are inſipid, and of an ill Smell; it taſtes of Artichoke. 'Tis conjectur'd that the *Sal Ammoniac* which is in it is wrapp'd up in a great deal of Sulphur and Earth; for by the Analyſis its *Leaves* give a concrete volatile Salt, and a great deal of Oil. The *Henbane* is ſoporiferous, reſolutive, and ſweetening; 'tis ſeldom us'd in internal *Remedies*. *Helidæus* valu'd much its *Seeds*, which he mix'd with Conſerve of Roſes, for the ſpitting of Blood. *Tragus* aſſures, that the Juice of *Henbane*, or the Oil made by the Infuſion of its *Seeds*, cur'd the Pains in the Ears, by ſyringing it into thoſe Parts. The *Henbane* is employ'd in anodyne Cataplaſms, to reſolve the Tumours. For Example; Two Handfuls of *Leaves* of *Henbane*, as much of thoſe of *Mendragora*, and an Ounce of *Seeds* of *Henbane*, and of Poppies, are boil'd in a certain Quantity of Milk; the Whole is ſtrain'd through a Cloth. There muſt be added to it the Yolk of an Egg, and ſome Saffron. Some content themſelves with boiling only the *Leaves* of *Henbane* in Milk, and apply them on the Places where the Gout is felt. Others ſoften the *Leaves* of *Henbane* under the hot Embers, and apply them on the Breaſts to expel the Milk from them, or to diſſipate it when knotted. *Tabernæ Montanus* ſays, that he had the *Seeds* pounded with Wine, and applied as a Cataplaſm on the Breaſts of Women newly deliver'd. The Oil of theſe *Seeds*, made by Expreſſion, has the ſame Virtues. For Chilblains, they are expoſed over the Smoak of *Seeds* of *Henbane*, burn'd on the Coals.

JACOBÆA *vulgaris*, *St. James-wort*, in *French Herbe, ou Fleur St. Jacques*. The *Leaves* of this Plant are bitter, aromatick, and a little aſtringent. They contain a great deal of Oil and terreſtrial Particles. *Dodoneus* ſays, that *St. James-wort* is vulnerary, deterſive, and proper for ſore Throats.

JUNIPERUS *vulgaris*, the *Juniper-Tree*, in *French Genievre*. By the Analyſis are extracted from this Plant ſeveral acid Liquors, a ſmall Quantity of fix'd Salt, but no volatile. We muſt obſerve, that the Salt of this Plant is wrapp'd up in a very great Quantity of Sulphur, and ſome terreſtrial Particles. The Wood of *Juniper*, beſides an æthereal Oil, gives a great deal of thick Oil, in the Conſiſtence of a Syrup. The Berries give a great deal more, and the Summits a little leſs. All theſe Principles render the *Juniper* proper to reſtore the Functions of the Stomach, to diſſipate the Wind, and griping Matters, to free the Lungs, and diſengage them of that thick *Lympha* which often obſtructs the Reſpiration. This Plant is, beſides, ſudorifick, cephalick, and hyſterick. It provokes the *Menſes*, carries off the Obſtructions of the *Viſcera*, reſtores their Springs, and helps the Evacuation of Urine. Uſe is made of the Wood, Summits, and Berries. The Decoction of the Wood volatilizes the Blood, and purifies it by the inſenſible Perſpiration. A half Bath is prepar'd with this Wood, which proves very beneficial to thoſe who have the Gout. The Wine in which the Summits of *Juniper* are boil'd is very diuretick. *Tragus*, *Matthiolus*, *Hartman*, and *Simon Pauli*, aſſure us, that they have cur'd ſome

dropsical Persons with this Sort of Wine. *Tournefort* says, that he has seen several Persons very much eased by the Pills made of two Parts of Aloes, and one of *Juniper-Berries*. From these Berries are extracted an ardent Spirit, a Tincture, an Elixir, and an Extract; and of them are prepar'd a *Ratafia*, and a Sort of Honey. The Tincture is made by macerating the Berries in their ardent Spirit; the Infusion of the same Berries in their Spirit, or in common Water evaporated to the Consistence of Honey, is call'd Elixir, or Extract of *Juniper*. The Honey of *Juniper* is nothing else but common Honey boil'd with *Juniper-Berries*. 'Tis good in Clysters, in the *Dysenteria*, and *Tenesma*. The *Ratafia* of *Juniper* is made by macerating its Fruit in Brandy, or Champaign Wine, adding to it some Sugar and Cinnamon. The Pulp of *Juniper-Berries*, freed from its Grains, and mix'd with Sugar, makes a Conserve which has all the Virtues of those Preparations heretofore mention'd. Lastly, the Fruit is burn'd to expel the bad Air, and macerated in Vinegar, in Time of the Plague, to wash Letters, Linnen, and even Plates.

LEUCANTHEMUM *vulgare*, *Daisies*, in *French Marguerite*. The *Daisies*, by the Analysis, give no volatile Salt, but only a fix'd one, and very lixivial, several acid Liquors, and a great deal of Oil and Earth; therefore 'tis very aperitive and detersive. A Diet-Drink made of them is prescrib'd to those who spit purulent Matter.

LIGUSTRUM, *Privet*, in *French Troëne*. The Flowers of this Plant are of a single Piece; the Leaves are astringent and bitter; therefore there must be in it an aluminous Salt wrapp'd up in a great deal of Sulphur; but the same Salt is much disengag'd in the Flowers and Fruit. The Plant gives by the Distillation a great Quantity of Oil and acid Liquor, with a little of urinous Spirit. All these Principles mix'd together, render the *Privet* very detersive. The Gargarisms made with the Juice, or the Water distill'd from that Plant, are proper for the Maladies of the Throat. They dry up Ulcers, appease the Inflammation of the Eyes, stop the spitting of Blood, and the Hemorrhages.

LINARIA, *Wild Flax*, in *French Velvote*. The *Leaves* of this Plant are very bitter, a little stiptick, and of an oily Smell. They do not change the blue Paper, therefore 'tis conjectur'd that their Salt is very near like the natural Salt of the Earth, but mix'd with much Sulphur and terrestrial Particles. The *Linaria* is vulnerary and detersive; it purifies the Blood, and restores the Balsam of Life, which consists in a Sulphur modified with an acerb Salt. *Cesalpinus* esteem'd this Plant for the scrophulous Tumours, and the *Lepra*. *Pina* and *Lobel* relate, that a Barber cur'd with it a carcinomatous Ulcer, which devour'd the Nose of a Person, after several Physicians had resolv'd it should be cut off. For the Cancer, Gout, and Dropsy, two Ounces of the Juice, or six of the Water distill'd from this Plant, are drank twice a Day. The following *Unguentum* is good for Ulcers, for the Piles, King's Evil, and all cutaneous Distempers. Let the *Leaves* of this Plant be macerated in as much White Wine as will cover them, for the Space of four and twenty Hours; the Juice must be strain'd, and afterwards boil'd to the Diminution of a third Part, adding to it as much Lard as is necessary to give it the Consistence of *Unguentum*.

LUPULUS, *fœmina*, *Hop*, in *French Houblon*. *Cesalpinus* has observ'd, that the Stalks of *Hops* which bear Flowers, bear no *Seeds*; and those which bear *Seeds*, bear no Flowers. *Tragus* and *Dodoneus* believ'd that the Fruits succeeded the Flowers. The *Hop* is bitter, detersive, and does not change the blue Paper. By the Analysis is extracted from this Plant very little Acid, a reasonable Quantity of Oil, and of concreted volatile Salt; which is an Indication that it contains an *Ammoniac Salt*, mix'd with Sulphur and Earth. For the hypochondriacal Affections, and Melancholy, Juleps and Apozems are prepar'd with *Hops*; to each Dose are added two Drachms of *Tinctura Martis*. The Syrup made with the Juice of this Plant has the same Virtues.

MELILOTUS, *Melilot*. This Plant is acerb, bitter, stiptick, and odoriferous; whence 'tis conjectur'd, that its Salt is much like the natural Salt of the Earth, but mix'd with much essential Oil, and terrestrial Particles; for by the Analysis the *Melilot*, besides much acid Phlegm, gives also a great deal of Oil and Earth, enough of urinous Spirit, of volatile concrete Salt, and of very lixivial Salt; therefore that Plant is diuretick, resolutive, and sweetening. The Diet-Drink made with its Summits, and those of Camomile, is excellent in the Inflammations of the Abdomen, the Cholick, and in the Retention of Urine, in the Rheumatism, and generally in all Occasions where the Course of Humours is to be facilitated. The Water distill'd from the Flowers of *Melilot* is of a grateful Smell. The *Melilot* is used in the carminative Clysters, and in the resolutive Cataplasms. For Clysters, the Flowers of *Melilot*, and those of Camomile, are boil'd in Tripe's Broth, and to the Decoction, after it has been strain'd through a Cloth, are added some Drops of Oil of Aniseed. For Cataplasms, two Roots of Lillies are boil'd with Half a Handful of Flowers of *Melilot*, and two Handfuls of Leaves of Henbane; the whole is strain'd through a Sieve, to which are added some Drops of fetid Oil of Tartar. The Juice of the Flowers of *Melilot*, or the Infusion of its Parts in boiling Water, appease the Inflammation of the Eyes; especially if after 'tis taken off the Fire there be added to it some camphorated Spirit of Wine; the whole being strain'd through a Cloth, to separate the needless Camphire.

MILLEFOLIUM, *vulgare*, *Yarrow*, in *French Mille-feuille*. This Plant is acerb, bitter, and aromatick, and changes much the blue Paper. It appears that the acid Part of the natural Salt of the Earth unloads it self of the other Principles through the Texture of this Plant, forms in it an aluminous Salt united with a small Quantity of aromatick essential Oil. By the Analysis, several acid Liquors are extracted from the *Yarrow*, much Earth, no concreted volatile Salt, and very little of urinous Spirit; therefore this Plant is vulnerary, resolutive, and astringent. 'Tis used in Diet-Drinks, and in Infusion, in the Manner of Tea. The Juice is prescrib'd for the immoderate Flux of the Piles, from three Ounces to six; the Powder from Half a Drachm to Half an Ounce. 'Tis also mix'd with Paste, to make astringent Biskets. *Tabernæmontanus* says, that the Water of *Yarrow* is good for the Epilepsy; and that the Wine, or Hidromel, made with this Plant, stops all Sorts of immoderate Fluxes.

NYMPHÆA ALBA, *Water Lilly*, in *French Nenufar*. The Root of this Plant is a little glutinous, bitter, and changes very much the blue Paper. By the Analysis it gives a great deal of Acid and Oil, and very little of volatile concreted Salt; therefore 'tis not surprizing if it be sweetening. The Flowers are distill'd, and made into Syrups and Conserves. Its Roots are commonly employ'd in cooling Diet-Drink for the Heat of Urine, the Inflammation of the Reins, and of the other *Viscera*. Its Syrup is a little soporiferous, and the Dose is an Ounce.

OPHYOGLOSSUM *vulgatum*, *Serpent's Tongue*, in *French Langue de Serpent*. The Leaves of this Plant are almost round; the Tongue, whence it takes its Name, comes out of the Pedicle of the Leaves, as by a kind of Insertion; 'tis of very near two Inches and a Half in Length, and two Lines broad, flat, polish'd, and bright; its Edges are raised, rounded, of a Line and a Half thick, and divided into transverse Partitions; these Partitions grow a little yellow when the Seeds begin to ripen; they are seen to burst at that Time, and the Seeds to fall as a kind of fine Dust. All Authors agree that this Plant is vulnerary, either used internally or externally. *Baptista Sardus* pretended to cure all Sorts of Wounds with its Oil, made by Infusion.

ORIGANUM *vulgare*, *spontaneum*, *Origan*. The

Origan

Origan is acerb, aromatick, deterſive, and changes but little the blue Paper; whence 'tis conjectur'd that it is full of volatile, aromatick, and oily Salt, which is not entirely free from Acidity. This Plant contains, beſides, a great Quantity of terreſtrial Particles. The *Origan* is diuretick, diaphoretick, proper to help Expectoration, and to provoke the Menſes. It muſt be uſed in the Manner of Tea, in the Aſthma, violent Cough, Indigeſtions, and the Pleuriſy. For a Cold, and the Rheumatiſm in the Neck, the *Origan* is dried at the Fire, and wrapp'd up very hot in a Cloth, with which the Head muſt be very well cover'd.

PAPAVER, *Erraticum majus*, *Poppy*, in *French Coquelicoc*. The Flower of this Plant, which is the principal Part employ'd in Medicine, is glutinous, and changes a little the blue Paper, like the Solution of *Opium*; whence 'tis believ'd that it has a Salt analogous to it. But in the *Opium*, that Salt, which approaches near the *Sal Ammoniac*, is mix'd with a great deal of fetid Oil, whereas in the *Poppy* there is a great deal leſs of Oil, and much more viſcous Phlegm; ſo that the Flowers of this Plant are ſweetening, and proper to help ſpitting in the Fluxions of the Breaſt, in Colds, and in dry Coughs. They ſtop the Hemorrhages, and are a little ſudorifick. The Water diſtill'd from the Flowers of *Poppies*, is preſcrib'd from three Ounces to ſix; the Tincture is taken by Glaſſes, in the Fluxions of the Breaſt. The following Diet-Drink is excellent for a dry Cough: You muſt boil three Ounces of Roots of *Bugloſs*, and as much of thoſe of *Gramen*, or *Graſs*, in two Pints of Water, and pour the boiling Decoction upon an Ounce of Flowers of *Poppies*, and upon three Heads of *White Poppies*, cut ſmall, and ty'd up in a little Sack. The dry'd Flowers of *Poppies* are uſed like Tea. A Conſerve and a Syrup is made of them.

PARIETARIA *Officinarum*, *Parietary*, in *French Parietaire*. By the Analyſis the *Parietary* gives enough Oil, much fix'd Salt, much Earth, and ſeveral Liquors, ſome of which are very acerb, and the others acid. As for volatile Salt, there's no concrete extracted from this Plant; but it gives an urinous Spirit. *Dioſcorides* aſſures us, that this Plant is reſolutive, and proper to ſtop the *ambulant* Ulcers. It was apply'd, in his Time, on the Parts where the Gout is felt, and its Juice was drank for old Coughs, and uſed in Gargariſms for ſore Throats. *Ceſalpinus* ſays, that the ſame Juice is diuretick, and unſtops entirely the Reins. *Tragus* prizes much the Decoction of *Parietary*, to carry off all the Obſtructions of the Abdomen. He had it apply'd in a Cataplaſm on the Region of the Bladder, for the Retention of Urine; but there was added to that Cataplaſm, Wine and Water-creſſes; the whole was fry'd, and apply'd as hot as the Patient could bear it. *Dodoneus* had that Cataplaſm made with only the *Parietary* and Oil of ſweet Almonds. For the Ruptures which cauſe exceſſive Pains in the *Scrotum*, *Camerarius* had it apply'd very hot on thoſe Parts, after it had been pounded with Vinegar. This Plant is at preſent uſed in all Decoctions, Clyſters, and deterſive Half-Baths. The Syrup of *Parietary* gives Eaſe to the Dropſical.

PERSICARIA, *Arſmat*, in *French Perſicaire*. This Plant changes the blue Paper; whence 'tis conjectur'd that its Salt approaches near the *Sal Ammoniac*, loaded with a great Quantity of Earth, and join'd to a little Sulphur; therefore 'tis aſtringent, vulnerary, and deterſive. It gives, by the Analyſis, a ſmall Quantity of concrete volatile Salt; the Decoction of the whole Plant is good for the *Diarrhœa*, and for cutaneous Diſtempers.

PLANTAGO, *Plantain*. The Leaves of this Plant are bitter, aſtringent, and change a little the blue Paper; the Roots change it more, and are only aſtringent; which ſhews, that in the Leaves the *Sal Ammoniac*, and the terreſtrial Particles of that Plant, are embarraſs'd with a great deal of Sulphur. Therefore the *Plantain* is vulnerary, reſolutive, and febrifuge. *Tragus* eſteems it much for the Phthiſick. Two Drachms of the Extract of this Plant, or a Drachm of its Seed in Powder, ſtops the *Diarrhœa*, and all Sorts of Hemorrhages. The Diet-Drink made of it, and the Water diſtill'd from it, have the ſame Virtues. They are preſcrib'd in the *Dyſenteria*, ſpitting of Blood, immoderate Fluxes of the Piles, or of the Menſes; in a Word, this Plant is uſed in all vulnerary and deterſive Potions. In the Inflammation of the Eyes *Camerarius* had a Collyrium made with the Juice of the Leaves, and of the Root, mix'd with Roſe-water and Sugar. *Simon Pauli* uſed the Extract of *Plantain*, and of the Decoction of *Sarſaparilla*, to cure a young Man who piſſed Blood after a *Gonorrhœa*. A Gargariſm of *Plantain* is excellent for a ſore Throat.

POLYPODIUM *vulgare*, *Oke-forme*, in *French Polipode*. The Root of this Plant analiz'd gives ſeveral acid Liquors, a ſmall Quantity of urinous Spirit, no concrete volatile Salt, a great deal of Oil, and ſome Earth. The Antients believ'd this Root purgative. *Menardus* is the firſt, among the Moderns, who diſcover'd that it purges but ſlightly; and *Dodoneus* confeſſes that it does not purge at all, unleſs it be boil'd in the Broth made of an old Cock, with Mallows and Leeks. The *Oke-forme* ſweetens the Blood, and carries off the Obſtructions of the *Viſcera*. It muſt be uſed for a dry Cough, when the *Saliva* is ſalt; in the Aſthma, Scurvy, and hypochondriacal Affections.

PRIMULA VERIS, *odorata*, *flore luteo*, *ſimplici*, *Primroſe*, in *French Primevere*. The Flowers of this Plant analiz'd give a great deal of Acid, very little urinous Spirit, no concreted volatile Salt, ſome Oil and Earth. The Flowers have an aromatick and oily volatile Salt; they are very aperitive, and very proper to reſtore the Courſe of the Spirits. *Tragus* preſcrib'd the Conſerve, or the diſtill'd Water of theſe Flowers, in the Apoplexy and Palſy. The Leaves and Roots of this Plant are aperitive and vulnerary.

PRUNUS *ſilveſtris*, *Wild Plum Tree*, in *French Prunier Sauvage*. The Leaves of this Plant are bitter, a little ſtiptick, glutinous, and change a little the blue Paper; but the Fruit changes it as much as Allum does. It is a little ſouriſh, and very ſtiptick; therefore there is an Appearance that the natural Salt of the Earth is predominant in the Leaves, where 'tis mix'd with a ſmall Quantity of fetid Oil; but the Acid of the ſame Salt diſengaging it ſelf in the Fruits, unites with Earth, and forms a Salt like Allum. *Tragus* has found, by Experience, that Water diſtill'd from the Flowers of *Wild Plum-Tree* is a ſovereign Remedy for the Pleuriſy, and the Oppreſſion of the Breaſt. When he had not the diſtill'd Water, he preſcrib'd the Wine wherein thoſe Flowers had macerated. He aſſures us, that the Fruits preſerv'd in Honey, or Sugar, are very good for all Sorts of *Diarrhœa's*. The Wine of *Wild Plums* has the ſame Virtues. *Matthiolus* uſed the Decoction of the Fruits and Roots for the Ulcers of the Mouth and Throat. The Juice of the Fruit appeaſes the Inflammation of the Eyes. *Wittichius* preſcribes, as a good Purgative, the Syrup made with ſeveral Infuſions of the Flowers of this Tree; they may be macerated in Whey. *Etmuller* ſays, that of the Juice of theſe Fruits, yet green, might be extracted by Diſtillation *in Balneo mariæ*, a very ſtrong Vinegar.

PULEGIUM *latifolium*, *Penny-Royal*, in *French Pouliot*. This Plant is very bitter, very acerb, of a penetrating Smell, and changes much the blue Paper; whence 'tis conjectur'd that it has an aromatick and oily volatile Salt, yet loaded with Acid; whereas in the artificial volatile Salt this Acid is ſtopp'd by the Salt of Tartar; therefore this Plant is aperitive, hyſterick, proper for the Maladies of the Stomach, and thoſe of the Breaſt, when 'tis wanting to diſſipate thoſe glotinous Matters which obſtruct the *Bronchia*, and *Veſicles* of the Lungs; eſpecially when boil'd with Honey and Aloes: For then, as *Dioſcorides* obſerves, it purges, and helps the Expectoration. *Tragus* ſays, that the Juice of this Plant clears the Sight, and carries off the Rheum. For the Diſtempers of the Eyes, *Montanus* preſcrib'd the Powder of *Penny-Royal* mix'd with equal Parts of Vinegar, Honey, and Water.

The Conſerve of the Flowers and Leaves of this Plant is good for dropſical Perſons, and for thoſe who have the Yellow Jaundice. Mr. *Ray* aſſures us, after Mr. *Boyle*, that a Spoonful of the Juice of *Penny-royal* is a good Remedy to appeaſe the convulſive Cough of Children. *Cheſneau* preſcrib'd a Glaſs of the Decoction of this Plant for Hoarſeneſs, and adviſed to take it at Night, going to Bed.

PULMONARIA, *rubro flore*, *Lung-wort*, in *French Pulmonaire*. This Plant has a ſalt and glutinous Taſte, and changes the blue Paper. It is employ'd in Diet Drinks, or in Broth made with Calves Lights, for the Diſtempers of the Lungs.

QUINQUEFOLIUM, *majus repens*, *Cinquefoil*, in *French Quintefeuille*. Mr. *Ray* has very well deſcrib'd the Fruit of this Plant. The Taſte of its *Leaves* has ſomething glutinous, they change a little the blue Paper, but the Roots change it more; they have ſome Acidity, and are ſtiptick, which makes us believe, that amidſt a great deal of Earth and Sulphur, they contain an aluminous Salt modified with a ſmall Quantity of *Sal Ammoniac*, which, in the *Leaves*, is very much embarraſſed in a viſcous Phlegm. This Plant is vulnerary, and aſtringent. By the Analyſis it gives a ſmall Quantity of concreted volatile Salt. Beſide the Extract prepar'd of the Roots, they are alſo ſucceſsfully employ'd in Diet-Drinks, and in the aſtringent Broths, for the ſpitting of Blood, the hemorrhoidal Flux, for the Heat of Urine, and for all ſorts of Hemorrhages. The Gargariſm made with the Decoction of this Plant, cures the Ulcers of the Mouth, and ſore Throats. It is aſſur'd, that a Drachm of the Powder of the ſame Root taken in a Glaſs of Water, before the Paroxyſm, carries off intermittent Fevers.

ROSA *ſilveſtris vulgaris*, *Wild Roſe*, in *French Eglantier*. The Conſerve of the Fruit of this Plant is cooling, ſweetening, and diuretick. It is known under the Name of Conſerve of *Cynorrhodon*.

RUBUS *ſilveſtris*, the *Blackberry-Buſh*, in *French Ronce*. The Leaves of this Plant are ſtiptick, and of an earthly Taſte; they change the blue Paper into a dark red; the Fruit changes it more. The Fruit is vinous, and of a pleaſant Smell, on ſome Buſhes, tho' very inſipid and ungrateful on others; there is a very great Likelihood that the Acidity of the natural Salt of the Earth, which, in the *Leaves*, is but ſlightly diſengag'd from the other Principles, is almoſt entirely free of them in the *Fruits*, and produces there, with the terreſtrial Particles, a Salt very near like Allum. The *Rubus* is aſtringent, deterſive, and abſorbent. *Dioſcorides* ſays, with Reaſon, that it ſtops the *Diarrhœa's*; the *Leaves* chew'd, clean the Ulcers of the Gums, and of the Mouth; pounded, and apply'd, they mortify and cure the Piles. Its Decoction is employ'd for the Wounds in the Legs. *Tabernæmontanus* ſays, that to ſtop the Flux of the Piles, there muſt be thruſt into the Fundament a Rag dipp'd in the Juice of *Rubus*. Mr. *Ray* relates that Dr. *Needham* had a vaſt Opinion of the Syrup made of the Fruits of this *Plant*, in the Heat of Urine.

RUSCUS *Myrtifolius*, *Butcher's-Broom*; in *French Petit-Houx*. The Root of this *Plant* is one of the five common aperitive Roots, proper to carry off the Obſtructions of the *Viſcera*, and to accelerate the Paſſage of Urine. For the Dropſy, Cachexy, Jaundice, Calculus, and the Retention of Urine; 'tis preſcribed in Broth, Diet-Drinks, and Apozems; for ſcrophulous Tumours half a Pint of White Wine, in which has been macerated a Drachm of the Powder of the Roots of *Ruſcus*, with equal Quantity of thoſe of *Scrophularia*, and *Filipendula*, muſt be drank for ſeveral Days ſucceſſively. The Conſerve of the Berries of *Ruſcus* is very good for the exceſſive Heat of Urine. The Seeds of *Ruſcus* are employed in the Compoſition called *Benedicta Laxativa*.

SALIX *Vulgaris*, *Willow*; in *French*, *Saulx*, or *Saule*. The *Willow* which bears Flowers bears no Seeds, and that which bears Seeds, no Flowers. The Decoction of the Leaves of *Willow* is good for the Spitting of Blood; 'tis given in Clyſters for the Diarrhœa.

SAMBUCUS, *Fructu in Umbella nigro*, *Elder-Tree*, in *French Sureau*. The Leaves of this *Plant* have at firſt a ſalt Taſte; and, afterwards, they are bitter. The Fruit is ſweetiſh.

By the Analyſis the Leaves, beſides ſeveral acid and alkaline Liquors, give a concrete volatile Salt, much Oil, and much Earth. Therefore there is Appearance, that this *Plant* operates by a *Sal Armoniack* more loaded with Acidity than common; and mixed with a great deal of fœtid Oil and Earth. The Salt, which is in the Fruit of *Elder*, approaches nearer the *Alum* than the *Sal-Ammoniack*. There is but a very ſmall Quantity of urinous Spirit extracted from its Parts, but much of Acidity, Oil, and Earth. *Bauhin*, and Mr. *Ray* have took the Flower of this *Plant* for a Flower of five Leaves, though *Tournefort* has found it of a ſingle Piece. *Hippocrates* uſed the *Elder* to purge, and to help the Evacuation of Urine. *Dioſcorides* ſays, that the Decoction of its Summities purges the Seroſities, and eaſe the Dropſicals, as well as the Wine, in which the Roots have been boiled. Theſe Parts, according to the ſame Author, are good for the Bite of Vipers, and for the hyſterick Paſſion, as well as the Fruit drank in Wine. *Dioſcorides* adds, that the Leaves of *Elder* appeaſe the Inflammation, cure the burnt Ulcers, the Bite of a mad Dog, and the Gout. *Tragus* and *Dodoneus* ordered to drink the Juice of the middle Bark of *Elder*, to purge the Bile, and the Seroſities, or had it macerated in Wine or Milk, after it had been pounded. *Geſner* preſcribed the Decoction of that Bark, for an excellent Sudorifick in the Plague. *J. Bauhin* ordered the Dropſicals to drink three Times a Day, an Ounce and a half of the Water of the middle Bark of *Elder*, *viz.* the firſt in the Morning, the ſecond at Noon, and the laſt at Night. The Flowers of this Tree fried with Eggs, purge well enough, but they muſt be freſh gathered, for they looſe their Virtue in drying. The Whey wherein thoſe dry'd Flowers have been macerated, are of a great Succour to thoſe who have the Small-Pox and the Ereſipele. They muſt drink a Glaſs of it Morning and Night, and have their Face waſhed with two Parts of the Water of the Flowers of *Elder*, and a Part of good *Spirit of Wine*. A Conſerve and a Syrup are made of thoſe Flowers. They are put in Vinegar, and boiled ſlightly with Honey, to be uſed in Clyſters. Of *Elder-Berries* are prepared the Rob, Extract, Spirit, Wine, Syrup and Oil. For the Rob a Pound of the Juice of *Elder-Berries*, with half a Pound of Sugar, is thickened on a ſlow Fire. The Extract, according to *Quercetan*, is made in the following Manner. The Fruits of *Elder*, dried from the Sun, muſt be put into a Matraſs, pouring over it the beſt *Spirit of Wine*, which muſt riſe about five Fingers breadth above the Fruit, adding to it ſome Spirit of Sulphur, and leaving the whole in Digeſtion during five or ſix Days; which expired, the Tincture muſt be filtrated, which is very good for the hyſterick: The Doſe is half a Spoonful, or a Spoonful. To make the Extract, the *Spirit of Wine* is drawn off by Diſtillation, and the Extract remains at the Bottom of the Cucurbit. The Doſe is a Scruple, or even a Drachm, for the ſame Diſtemper, and for the Diarrhœa. The ardent Spirit of *Elder-Berries* is a very great Sudorifick, as well as the Juice of thoſe Berries, which is eaſily preſerved, or with Oil, or mixing with it one Third of the beſt *Spirit of Wine*. Of the Grains of thoſe Berries is extracted an Oil, which appeaſes the Gout. For the ſame Malady another Sort of Oil is uſed, made by the Reſolution of the Leaves of *Elder*, whoſe Ribs are bruiſed, and afterwards put into an earthen Pot, which being very cloſely luted, with Plaiſter, is buried very low in the Ground; at the End of a Year is found in the Bottom of that Pot a Sort of Oil, very good for the Gout. The Leaves of *Elder* boiled in ſtrong Wine are very reſolutive; they carry off the Swelling of the Legs of the Dropſicals,

Dropſicals, eſpecially if a vaporous Bath be made of them, or frequent Fomentations, and the Leaves are applied in Cataplaſms, 'tis proper to mix with it the Leaves and Flowers of Tanſy. *Mathiole* gives the Deſcription of an excellent *Unguentum* for a Burn. He will have a Pound of the middle Bark of *Elder* boiled into two Pounds of Oil of Olive; the Oil is ſtrained through a Cloth; when the Bark is become black, and ſeems to be done enough, there are added to it two Ounces of new Wax, and as much of the Juice of the tendereſt Branches of *Elder*, which is boiled to the Conſumption of the Juice. This done, the Veſſel is taken off the Fire. Then muſt be added to it two Ounces of *Turpentine*, four Ounces of *Olibanum*, and two hard Yolks of Eggs. The *Unguentum* is preſerved in an earthen Pot for the Gout, for the Inflammation of the Piles, and for Burns. It ſuffices to boil the middle Bark of the Branches of *Elder* in Oil of *Olives*, or in that of *Walnuts*, and to give it the Conſiſtence of *Unguentum*, with a ſufficient Quantity of new Wax, and Yolks of Eggs; nothing can eaſe more thoſe who have been burnt with Gun-Powder, than to apply immediately on the burnt Part the common Honey, and afterwards the Oil of *Walnuts*, with which has been boiled the *Elder*.

Saxifrage *Rotundifolia*, *Saxifrage*. This *Plant* is eſteemed a very grand Diuretick The Infuſion of its Roots in *white Wine*, or in *Cinnamon-Water*, is its uſual Preparation. *Fachius* aſſures us that it provokes the *Menſes*, and that it purges the Lungs of that thick *Lympha* which hinders its Motion.

Scabiosa *Pratenſis Hirſuta quæ Officinarum*, *Scabious*; in *French Scabieuſe*. The Figure which *Tabernæmontanus* gives of this *Plant* is very good. The *Scabious* is bitter, and changes, a little, the blue Paper; whence 'tis conjectured that it contains a Salt which approaches near the *Sal-Armoniack*, mixed with great Quantity of fœtid Oil and Earth; for by the Analyſis, beſides ſeveral acid Liquors, there are extracted from this *Plant* much Sulphur and Earth, a ſmall Quantity of urinous Spirit, and of a concrete volatile Salt. The *Scabious* is ſudorifick, aperitive, deterſive, vulnerary, proper to help the Expectoration, when the *Brunchia*, and the Veſicles of the Lungs are ſtuffed with a thick and glutinous Phlegm. The Juice of this *Plant* is preſcribed from three Ounces to ſix, in which is diſſolved a Drachm of *Teriake*, and ten Grains of Camphire, when the Patient muſt be ſweated. This Remedy is good in malignant Fevers, in the Small-Pox, the Meaſles, and the Pleuriſy, after the Uſe of the antimonial Remedies. The Water of *Scabious*, and that of *Carduus Benedictus*, are commonly mixed in expectorative and ſudorifick Juleps. A Syrup is made of the Juice extracted from the whole *Plant*, which is very proper for all cutaneous Diſtempers. But, mean while, the Parts muſt be waſhed with the Decoction of *Scabious*; with every Pint of that Decoction are mixed three Spoonfuls of camphorated Brandy; the whole is ſtrained through a Cloth, to ſeparate the Camphire chilled on the Decoction, drank by Spoonfuls, 'tis good for the Vapours. *Tabernæmontanus* ſays, that the Juice of *Scabious*, mixed with ſome *Borax* and *Camphire*, carries off thoſe Spots ſeen often on the *Cornea*.

Scrophularia *nodoſa fœtida*, *Blind Nettle*; in *French*, *Scrofulaire*. The Leaves of the *Blind-Nettle* are very bitter, of a very ill Smell, and change very little the blue Paper; the Root changes it more. Therefore 'tis believed that the *Sal-Ammoniack*, which is in the natural Salt of the Earth, is predominant in this *Plant*, where 'tis mixed with a great Quantity of fœtid Oil. By the Analyſis are extracted from the *Blind-Nettle*, much volatile concrete Salt, and much Oil; therefore 'tis reſolutive and emollient; theſe are the eſſential Qualities of the Remedies proper to reſolve the Humours accompanied with Inflammation, and thoſe called cold. The Juice of this *Plant* is uſed to clean the moſt dirty Ulcers; the *Unguentum* made with the Roots of this *Plant* is uſed to reſolve the ſcrophulous Tumours, and to abate the Inflammation of the Piles.

Serpillum, *Wild Betony*; in *French Serpolet*; there are different Species of this *Plant*, but they all become alike by the Culture. *Wild Betony* is a little bitter, acerb, ſtiptick, odoriferous, and changes the blue Paper. There is Appearance that it abounds with aromatick and oily volatile Salt; but this Salt retains yet Part of the Acidity of the *Sal Ammoniac* of the Earth, when as in the artificial oily and aromatick volatile Salt, the acid Part of the *Sal Ammoniac*, has been ſtopt by the Salt of Tartar, therefore the *Wild Betony* is cephalick, ſtomachal, and proper for the Vapours. It deſtroys the exploſive Matter which cauſes the convulſive Motions. It furniſhes the Blood with ſpirituous Particles, it reſtores the natural Functions, and carries off the Obſtructions. The Spirit of this *Plant* and the Water diſtill'd from it, are very proper for ſoporous Affections, and for the Vapours. Its eſſential Oil, or the Water extracted from its Flowers, macerated in Brandy, and diſtilled afterwards, are eſteem'd for the Epilepſy. For a Cold, or an old Cough, two large Handfuls of *Wild Betony*, are thrown into a Pint of boiling Water. Then the Pot is taken off the Fire, and cover'd, afterwards two Spoonfuls of white Honey are diſſolv'd in the Infuſion: Which the Patient muſt drink, very hot, at Night in going to Bed. The Conſerve made of the Flowers of this *Plant*, is a Remedy for the Epilepſy.

Senapi, *Rapi Folio*, *Muſtard*; in *French*, *Moutarde*. The Seed of *Muſtard*, by the Analyſis, gives more Signs of an acrimonious, than of an acid Salt; but there are extracted from it a very conſiderable Quantity of Oil, very little Salt fixt; much Earth, a ſmall Quantity of urinous Spirit, and no volatile concrete Salt. This Seed is ſtomachal, diaphoretick, antiſcorbutick. It is good for the hypochondriacal Affection, for the Green-ſickneſs, the Cachexy, and the ſoporous Affections. The Seed of *Muſtard* is order'd to be chewed in the Morning faſting, by thoſe who are threaten'd with the Apoplexy. The following Cataplaſm is good for the Rheumatiſm in the Breaſt: Leeks cut ſmall, muſt be fry'd with a little Vinegar, till they be done, then they are powder'd over with pounded Muſtard-ſeed. This Cataplaſm is apply'd on the Part where the Pain is felt; 'tis very reſolutive.

Symphytum, *Conſolida Major*, *Walwort*; in *French Conſoude*. The Leaves of *Walwort* are inſipid, glutinous, and change but little the blue Paper. This *Plant* contains a Salt very like that of Coral, diſſolv'd in a very glutinous Phlegm, in which there is a little Sulphur, and very little *Sal Ammoniac*; for by the Analyſis the *Walwort* gives ſeveral acid Liquors, much Earth, very little Sulphur, no concrete volatile Salt, but ſome urinous Spirit. As for the Salt fix'd, 'tis found in it to ſome Quantity. There is Appearance that this *Plant* operates, chiefly by its glutinous Juice, which the Fire deſtroys. *Dioſcorides* aſſures that its Roots are vulnerary; that their Juice is good for the ſpitting of Blood, and for Ruptures. The Moderns uſe it in Hemorrhages, occaſion'd by the Acrimony of the Salts, which renders the Blood too fluid; and in the Fluxions of the Breaſt cauſed by ſalt, and corroſive Seroſities. The Roots are preſerv'd in Sugar, and are alſo made into Lozenges. The Syrup of *Walwort* prepar'd according to *Fernel*'s Preſcription, is much compoſed; that of *Dodoneus* as much. The Roots of *Walwort* pounded and apply'd in Cataplaſms, appeaſe the Gout, and ſtop ambulant Ulcers. M. *Tournefort* uſed to have ſome Drops of the fetid Oil mix'd with the Root of *Walwort* well pounded, and apply'd on the Part where the Gout was felt.

Tabacum, *Tobacco*, in *French Tabac*; is a Plant which was firſt brought into *Europe* by the *Portugueze*, from the Iſland *Tabaco*. It is alſo call'd by the *French Nicotiana*, becauſe firſt ſent into *France* by *John Nicot*, Author of the Dictionary which bears his

Name, while he was Ambaſſador from *Francis* II, King of *France*, to *Sebaſtian* King of *Portugal*, in 1560. This is the Sentiment of *Guido Creſcentius Fagon*, (firſt Phyſician and State-Counſellor to the late King of *France*, *Lewis* XIV, in a Theſis held publickly in the Schools of Medicine at *Paris*, the 24th Day of *March*, 1699.) of the Virtues of that Plant. That learned Man expreſſed himſelf in the following Terms:

Si recto & moderato adminiſtretur uſu (Nicotiana) primas inter optima medicinæ inſtrumenta partes obtinet. Naribus ſcilicet, cum opus eſt, excepta, vel integra, vel trita in pulverem, membranam ſtimulat, quæ naſi, & oſſium quibus extruitur receſſus varios conveſtit; illa vero contracta papillos, & glandulas, quibus eſt intexta, conſtringit, atque ex his, velut ex ſpongiis manu compreſſis, mucum exprimit; quo quidem expurgato, ſeroſi latices motum eundem ſecuti, non ſecus ac aqua Siphonibus elicita, e vaſis & glandulis vicinis continenter evocantur. Nec inſtigatione diſſimili, ſive Tabaci fruſtulum ore contineatur: Sive fumus a fiſtulis hauriatur; glandulæ maxillis appoſitæ, & ſalivæ ductus ſtimulati, contractione repetita Salivæ vim maximam evomunt, qua fluxionum materia derivatur, & ſucceſſiva membranarum vellicatione, pulmo viſcoſa pituita expeditus, ab aſthmate, tuſſi, Catharro, & aliis periculoſis affectibus liberatur; nec modo crudelis dentium dolor ejus Sulphure conſopitur: Quinetiam ſephentis Homerici vires gerit, ſollicitæque inducit oblivia vitæ; contracta facit in pauperiate beatum, & cum ſpe divite manat in venas, animumque juvat: Imo & quibus res eſt anguſta Domi, annonæ penuriam fallit, & defluentis in ventriculum pituitæ copia, tolerandam præbet inediam, aut ſtupefacto nervorum ſenſu, diſſimula a fame latrantem Stomachum lenit; nec ſolum internis medetur incommodis; ſed externa quoque depaſcentia curat ulcera, & quæ plurium vim medicamentorum eluſerant, putridis abſumptis carnibus, ducet ad cicatricem. Sed quanto potentius tot præſtat admiranda, tanto certius conſtat, quam multa ſint a Nicotianæ abuſu pertimeſcenda, cum enim Cauſtici vim exerit, qua & ſordida mundat Ulcera, & ad vivam uſque carnem cadaveroſo, & quaſi carneos extuberantes proceſſus exedit; quos hoc adurente ſale, tumultus excitabit, ſi frequentiore conſuetudine naribus admota, vel excepta fumo, teneras membranas offendens, gutturis & ventriculi nervos, in ſpaſmos egerit, cumque illis nervorum genus omne commoverit? Quid damni non afferet Saliva ſi eo ſale imbuta, in ventriculum impluens, alimentis admiſſis, & mox in Chylum verſis, cum ſanguine in totum corpus deportandis, acrimoniæ hujus Semina inſperſerit, &c. i. e. If *Tobacco* be uſed with Judgment and Moderation, it may juſtly claim the Precedency of all other Remedies; for if thruſt whole, or in Powder, into the Noſe, when Neceſſity requires it, it pricks the Membrane which lines the innermoſt Parts of the Noſe, and the Bones which enter into its Compoſition; that Membrane being thereby contracted, preſſes the *Papillæ*, and ſmall Glands found in its Texture, and from them, as from Sponges ſqueez'd with the Hands, forces out the Snot, which being purg'd, Streams of Seroſities following the ſame Motion, like Water running through a Cock, are continually flowing from the adjacent Veſſels and Glands. A like Thing happens when *Tobacco* is chew'd or ſmoak'd; for the maxillary Glands, and ſalivary Ducts, being likewiſe thereby irritated by a repeated Contraction, diſcharge a conſiderable Quantity of that *Saliva* which cauſes the Fluxions; and by the ſucceſſive Contraction and Extenſion of the Membranes, the Lungs, purg'd of a viſcous *Pituita*, are free from Aſthma, Cough, Catarrh, and other dangerous Affections. *Tobacco* appeaſes, likewiſe, by its Sulphur, the excruciating Pain of the Teeth; nay, it has even the excellent Qualities of the *Nepenthes* of *Homer:* For it makes us forget the Cares of this Life, renders us happy in the moſt extream Poverty, carries along with it, into our Veins, the moſt flattering Hope; eaſes our Mind, and even ſupplies the Want of Victuals: For by its Means, an abundance of *Pituita* falls into the Stomach, which renders Hunger ſupportable, and having ſtupified the Senſe of the Nerves, appeaſes the craving Stomach. *Tobacco* is not only a Remedy to our internal Indiſpoſitions, but cures, likewiſe, gnawing Ulcers, and by eating the putrid and fungous Fleſh, cicatrizes thoſe which have render'd abortive the Virtues of the beſt Remedies. But as much as *Tobacco* is capable to produce all theſe ſalutary Effects, it is as certain, that it can alſo be attended with very dangerous Conſequences, when taken to Exceſs, or without Judgment: For as it has a corroſive Faculty, whereby it mundifies the moſt filthy Ulcers, and corrodates the ſwelling and cadaverous Proceſſes, to the quick Fleſh; what dangerous Effects will it not produce, by its burning Salt, if too often taken in Snuff, or ſmoak'd; for then, wounding the tendereſt Membranes, it renders the Nerves of the Throat and Stomach convulſive, and throws the whole nervous Mechaniſm into Diſorder. Of what Detriment muſt be the *Saliva*, if falling into the Stomach, impregnated with that Salt, it communicates to the Aliments, already chang'd into Chyle, that dangerous Acrimony, to have it carry'd through the whole Body by means of the Circulation of the Blood? *&c.*

TEA. M. *De Farcy* ſpeaks thus of *Tea: Pretioſum iſtud folium duplici Subſtantia conſtat; fixa, terreſtrique altera, ſed paucula, quam ſubamarus ſapor palam facit; altera volatili Sale fæta, & uberrimo, cujus argumentum ſuaviſſimus odor liquorem, in quo Tea leniter admodum ebullierit, abunde ſaturaturus. Decoctum, itaque, tot opibus affluens. Cerebrum impletis ſomni vicibus, animabit ad vigilias, veterno detentum excitabit, crapula grave confeſtim expediet, imbecilliori ventriculo robur adjiciet incredibile, ſpurciſſimum Lienem expurgabit, molliet Colicos dolores, Scabros illuvie renes abſtergit, Rheumaticos Arthriticoſve cruciatus venientes arcebit procul, exin ſorte non redituros. i.e.* This precious Leaf, TEA, contains two Subſtances, one fix'd, and the other terreſtrial, which render its Infuſion bitter; but the other abounding with volatile Salt, communicates a grateful Smell to the ſame Infuſion, which Infuſion produces the following good Effects: It diſſipates ſoporous Affections, and keeps one awake; it cures Ebriety, or exceſſive Drinking, and ſtrengthens the Stomach; it raiſes the Obſtructions of the Spleen, or Milt, cures the Cholick, and cleanſes the Reins of a viſcous *Lympha*; it appeaſes the excruciating Torments of the Rheumatiſm and Gout, and perhaps might render the Cure perfect.

TORMENTILLA, *ſylveſtris*, *Tormentille.* The Flower of this Plant is of four Leaves. The Root of *Tormentille* is ſtyptick, very bitter, and changes a little the blue Paper; the Leaves change it leſs; they have a glutinous Taſte. By the Analyſis, this Plant gives only an urinous Spirit, no volatile concrete Salt, much Acid, Oil, and Earth; therefore there is Appearance that it contains an aluminous Salt, wrapp'd up in a great deal of Sulphur, and mix'd with very little *Sal Ammoniac.* This Plant is vulnerary, aſtringent, and deterſive.

TUSSILAGO *vulgaris*, *Fole-foot*, *Colts-foot*, *Horſe-foot*; in *French Tuſſilage*, *Pas Daſne*, *Pas de Cheval.* The Leaves of this Plant are green a-top, lanuginous, and white underneath; they are bitter, glutinous, a little ſtyptick; they taſte of Artichoke, and change very little the blue Paper. It ſeems as if there was in this Plant a Salt like that of Coral, wrapp'd up in Sulphur, and much viſcous Phlegm. The Leaves and Flowers of *Colts-foot* are ſweetening, moderately aperitive, and dedicated (if I may uſe the Expreſſion) to the Maladies of the Breaſt, cauſed by acrimonious and ſalt Seroſities. Aſthmaticks are order'd to ſmoak the Leaves, inſtead of Tobacco. Mr. *Boyle* adviſes to mix the Flowers of Brimſtone with thoſe of *Colts-foot*, and aſſures us, that it has cur'd ſeveral Phthiſicks. In *Dioſcorides*'s Time, thoſe ſort of Patients were made to receive, by the Mouth, the Smoak of the Leaves of *Colts-foot.* The Leaves and Flowers are uſed in pectoral Decoctions, and in the Loches proper to facilitate Expectoration; a Syrup and a Conſerve are made of thoſe Flowers. The following

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Diet-Drink is very good for a dry Cough: Four Pints of boiling Water are pour'd over four Handfuls of the Leaves of *Colts-foot*, and Half a Handful of its Flowers, Half a Handful of the Summits of Hyſſop, an Ounce of dry'd Raiſins, and three Spoonfuls of the beſt Honey; the whole is left to boil for the Space of two Minutes, then it muſt be taken off the Fire, and cover'd, and the Diet-Drink ſtrain'd, when 'tis cold.

VALERIANA *ſilveſtris*, *Valerian*, or *Setwal*; in *French*, *Valeriane Sauvage*. The Leaves of this Plant have no Smell, but they have a Taſte of Salt Herb, bitter, and change the blue Paper; the Roots change it but little; they are bitter, ſtyptick, of an aromatick Smell, but penetrating, and which has ſomething unpleaſant. This Plant has an aromatick and oily volatile Salt, loaded with Part of the Acid of the *Sal Ammoniac*, whereas in the artificial oily volatile Salt that Acid has been ſtopp'd by the Salt of Tartar. Therefore the *Valerian* is anti-epileptick, ſudorifick, hyſterick, and proper to provoke the Menſes. It eaſes much the Aſthmaticks, and thoſe who are ſubject to Vapours. *Camerarius* eſteems it for the Jaundice, and *Columna* for the Epilepſy. This Author pretends to have cur'd Epilepſies in uſing theſe Roots. He adviſes, to gather it before it ſhoots forth the Stems, to reduce it into Powder, and take Half a Spoonful of it in Wine, Water, Milk, or other Liquor. It may be given to Children, and to all thoſe who are ſubject to Convulſions. For the Hyſterick, and the moſt violent Paroxyſms of the Aſthma, a Pint of boiling Water muſt be pour'd over an Ounce of the Roots of this Plant, and the Veſſel being taken off the Fire, and cover'd, the Infuſion is taken by Glaſſes. The Extract of theſe Roots is good for the ſame Maladies. The Doſe is a Scruple, with a Grain of Laudanum, or the Laudanum is mix'd with the Powder.

VERONICA *mas*, *ſupina*, *& vulgatiſſima*, *Veronick*. The Leaves of *Veronica* are bitter, and change the blue Paper; whence 'tis conjectur'd, that they have a Salt which approaches very near the Salt of Coral, beſides 'tis mix'd with much Sulphur; for by the Analyſis are extracted from this Plant much Earth, much Acid, and much Oil. Theſe Principles render the *Veronica* ſudorifick, vulnerary, deterſive, diuretick, and proper to free the Lungs from glutinous and purulent Matters. *Tragus* aſſures us, that in a malignant Fever, two Ounces of the Spirit of *Veronica*, mix'd with ſome Theriac, is a very good Sudorifick. The Water diſtill'd from this Plant is excellent for the Ulcers of the Lungs, for the Calculus, and the Vapours; eſpecially if in two Ounces and a Half of that Water be macerated a Drachm of the Leaves of the ſame Plant, and as much of the middle Bark of Nightſhade. The Syrup and Extract of *Veronica* purify the Blood, and are proper for the cutaneous Diſtempers; but the Parts muſt be waſh'd, at the ſame Time, with the Water of *Veronica*, in which has been diſſolv'd ſome Vitriol. Clyſters made with a Pound of the Decoction of this Plant, an Ounce of Butter, and as much Sugar, are much valu'd for the Cholick. Some have the *Veronica* and Camomil boil'd in Milk, and add Sugar to it. The *Veronica* is often uſed in the Manner of Tea; 'tis alſo mix'd with the vulnerary Plants, in Potions, and Diet-Drinks.

VIOLA *martia*, *purpurea*, *flore ſimplici*, in *Engliſh* and *French Violet*. The Root of this Plant is a little ſalt, glutinous, and deterſive; it does not change the blue Paper, no more than the Leaves, which are inſipid, and more glutinous. The freſh Seeds change it a little, and are ſalter than the Roots. There is in the *Violet* a glutinous Sap, which wraps up the other Principles, and ſtops their Activity; for by the Analyſis are extracted from this Plant ſeveral acid Liquors, much Oil, a ſufficient Quantity of concrete volatile Salt, enough lixivial fix'd Salt; but 'tis not ſurprizing if it be ſweeten'd by its Phlegm, and its Oil, and if it is diuretick, and laxative by the Mixture of the other Principles. The Salt of the *Violet* participates of the *Sal Ammoniac*, ſince 'tis compoſed of an urinous Part. The Infuſion of two Ounces of the Roots of this Plant, is both emetick and cathartick; the Leaves are emollient and laxative, they are employ'd every Day in Clyſters, Fomentations, and Cataplaſms; the Flowers are looſening. *Poterius* aſſures us, that a Drachm of their Powder purges well enough. Of them are prepar'd three Sorts of Syrup; the ſimple, whoſe Colour is very beautiful, provided it be not boil'd; the compound, which is the Invention of *Cheſve*; and the purgative, of which *Lemery* gives the Deſcription. The ſimple, and the compound, are very proper for the Maladies of the Breaſt, cauſed by acrimonious and ſalt Humours; thoſe Syrups are cooling. The purgative Syrup is proper for the ſame Diſtempers, when a Purgative is wanted; for the Seeds and *Calices* of the Flowers uſed in that Syrup, purge very well, the Roots could very well be added to it. *Etmuller* relates, that *Timæus* uſed to prepare a very good laxative Conſerve of the Flowers of *Violets*, by giving to *Manna* the Conſiſtence of Conſerve, with the Juice of theſe Flowers; that Conſerve kept the Body open. The Doſe was from a Drachm to Half an Ounce. A ſort of *Ratafia* is prepar'd in the following Manner, for thoſe who are coſtive: In ſix Pounds of the Juice of the Flowers of *Violets* muſt be diſſolv'd, on a clear and gentle Fire, a Pound and a Half of *Manna*, the whole to be ſtrain'd through a Cloth, adding to it a Pint of very good Spirit of Wine. A Spoonful or two of this *Ratafia* muſt be taken, if neceſſary, Morning and Night. For the Nephritick, and the Retention of Urine, the following Emulſions are prepar'd: Let an Ounce, or an Ounce and a Half of Seeds of *Violets* be pounded in a ſtone or marble Mortar, adding to it ſix Ounces of the Water of *Gramen*; ſtrain the Emulſion through a Cloth, and mix with it an Ounce of Syrup of *Violets*.

VIRGA AUREA, *vulgaris*, *latifolia*, *Golden Rod*; in *French Verge dorée*, or *Verge d'Or*. The *Golden Rod* is ſtyptick, bitter, and does not change the blue Paper; there is Appearance that its Salt is very near like the natural Salt of the Earth, but that it is mix'd with much Oil and terreſtrial Particles; therefore this Plant is vulnerary, and diuretick. It is preſcrib'd in Diet-Drinks for the *Dyſenteria*, and for all Sorts of *Hemorrhages*. The Water diſtill'd from its Summits, and the Extract of the whole Plant, have the ſame Virtues; the Flowers and Leaves of the *Golden Rod* are uſed like Tea; 'tis employ'd in the *Arquebuſade* Water, and in vulnerary Potions.

VISCUM *baccis albis*, *Miſletoe*, in *French Gui*. This Plant is never found on the Earth, but it grows on the Oak, Plane-tree, Apple-tree, Pear-tree, and on ſeveral others. The *Miſletoe* occupies the ſoundeſt Branches of the Tree, and on thoſe Branches there is neither Earth found, nor any other Matter, which could appear proper for the Vegetation of the Seed of that Plant; there is only a Tumour on the Places where the Foot of the *Miſletoe* is ty'd. Its Flowers grow three and three, like the *Trifolium*, in the Diviſion, and at the Extremities of the Branches. Each Flower is yellowiſh, and of near three Lines in Diameter, thick as *Morocco* Leather; they are fill'd with a Duſt ſemblable to the Flower of Brimſtone, though thoſe Flowers produce nothing; for the Fruit of this Plant grows on Branches different from thoſe which bear the Flowers; thoſe Branches are found, ſometimes, on the ſame Stalk with thoſe which bear the Flowers; and ſometimes, alſo, on Stalks which only bear Fruit. Each Fruit begins by a ſmall oval Embryo, environ'd with four thick yellowiſh Leaves, Half a Line long, pointed, and which fall eaſily; this Embryo grows inſenſibly, and becomes an oval Berry, of three Lines long, like a ſmall Pearl, fill'd with a flat Seed, in Form of a Heart, and wrapp'd up in a whitiſh and ſweetiſh Glue, in which the Seed vegetates naturally. There is Appearance that this Seed produces the young Plants of *Miſletoe* ſeen on the Branches of Trees. However, it cannot be ſaid that this Seed

paſſes

paſſes through the Root of the Oak, or of the other Trees, that it aſcends into the Branches, by the Veſſels, which carry the nutritious Juice; ſince each Seed has two Lines of Diameter, and the Texture of thoſe Veſſels unperceptible; therefore this Seed muſt be applied to the Bark of the Branches of the Tree, by ſome external Cauſe. Thoſe Cauſes may be reduced to two principals.

1. To the Birds, which, perhaps, bruiſing thoſe Berries with their Feet, or with their Bills, occaſion their faſtening by their Glue to the Branches; hence we ſee that *Magpies* and *Jays* contribute to the Multiplication of ſeveral *Plants*, by tranſporting and burying their Seeds. It might likewiſe happen that the Birds which have ſwallowed the Berries of *Miſſeltoe*, void them on the Branches of the Trees.

2. It might happen alſo that thoſe Berries falling of themſelves, or by the Violence of the Winds, ſtick ſometimes againſt the Branches of the neighbouring Trees, eſpecially if they are applied to it on that lacerated Side, they were tied to the Branches of the *Miſſeltoe*; for that lacerated Side fixes itſelf eaſily to the Bodies on which it falls; but in whatever Manner thoſe Berries fix themſelves, we may ſuppoſe that the Glue they are filled with, ſoftens inſenſibly the Bark; and then the Seed which has budded in the Berry, perforates it eaſily by its Radicle; perhaps the Glue, though ever ſo inſipid, ferments with the nutritious Juice of the Tree, and lacerates the Fibres of the Bark 'tis found in, whereby is facilitated the Paſſage of the Fibres of the Radicle; thus the Eggs of the Female, ſays *Tournefort*, falling into the Body of the *Matrix*, fix themſelves to it by Means of the *Placenta*, whoſe Juice fermenting with that of the Glands of the Bottom of the *Matrix*, cauſes a ſmall Inflammation, by means whereof thoſe two Bodies unite together.

The Radicle of the Seed of *Miſſeltoe*, finding a Facility to penetrate into the Bark of the Branches extends itſelf into greeniſh Fibres, which run at firſt into the Subſtance of the Bark, and perforating afterwards the ligneous Body, intermix with the Fibres of the Branches, and penetrate into their Veſicles, whence they draw a Juice proper for their Nutrition. 'Tis not ſurpriſing, ſays again *Tournefort*, that the Place, where they inſinuate themſelves, grows bigger; ſince they increaſe its Volume, and that thoſe Roots, beſides, by increaſing, preſs the Veſſels of the Branches in ſome Places, ſtrangle and lacerate them in others; which cauſes the Interception and Extravaſation of the Juices they contained.

The *Miſſeltoe* cannot live but on Trees, becauſe, perhaps, its Radicle having no Structure to ſeparate from the Earth, and to prepare the neceſſary Nutrition for the Vegetation of the *Plant*; 'tis neceſſary that Preparation ſhould be made, in the Root of another *Plant* which might ſerve as a Nurſe to it.

URTICA *urens*, *minor*, a *Nettle*; in *French Ortie Grieſh*. The Leaves of all the Species of *Nettle* have an inſipid and glutinous Taſte, and do not change the blue Paper; the Roots change it a little; they are alſo inſipid and a little ſtiptick; whence 'tis conjectured that the Species of *Nettle* have a Salt, very near like the natural Salt of the Earth; *i. e.* compoſed of *Sal-Ammoniack*, Nitre and marine Salt. But in this *Plant* that Salt is embarraſſed in much glutinous Phlegm, and united with a great deal of Sulphur and terreſtrial Particles; for by the Analyſis, are extracted from *Nettles*, a concrete volatile Salt, much Sulphur and Earth, with ſeveral Liquors, which gives great Indications of acrimonious and acid Salt; therefore there is Appearance that the Phlegm of theſe Herbs is more thickened by the terreſtrial Particles, than by the acid. But that thickened Phlegm, which is in a conſiderable Quantity, is entirely deſtroyed by the Fire. Nevertheleſs, 'tis not ſurpriſing, if the *Nettles* be deterſive, diuretick, and proper to reſtore the Motion of the Liquors; for the glutinous Phlegm only moderates the too great Activity of the acrimonious Salt. The Juice of *Nettles* depurated, or by itſelf, or by a gentle Ebullition, ſtops the Spitting of Blood, and the Flux of the Piles; 'tis alſo very good for the Dyſentery, and other immoderate Fluxes. The Cataplaſm of *Nettles* is emollient, and reſolutive; and therefore very proper to melt the Humours, accompanied with Inflammation. It eaſes the Gout, and diſſipates ſometimes the cold Tumours. For the *Calculus* and the Gravel, the Leaves of the *Nettles* are uſed in the Manner of Tea; or macerated in Wine. The Roots of *Nettles* preſerved in Sugar are very good to facilitate the Expectoration, in an old Cough, in the Aſthma, and in the Pleuriſy; eſpecially if the Leaves are applied in Cataplaſms, on the Side, where the Patient feels the Pain. Some preſcribe the Juice of the *Plant* for the ſame Maladies, the Conſerve of the Grapes of *Nettles*, and the Extract of the whole *Plant* purify the Blood. The Diet-Drink of *Nettles* is very good in malignant Fevers, in the Small Pox, and Meaſles. Emulſions might be made with the Water and Seeds of this *Plant*.

XANTHIUM, *Leſſe-barre*. The Leaves of this *Plant* are bitter, aſtringent, and do not change the blue Paper. 'Tis aſſured that the Uſe of it cures the King's-Evil, and purifies the Blood. The Patient muſt drink ſix Ounces of the Juice, or take a Drachm of the Extract. The Leaves pounded, are applied on ſcrophulous Tumours.

Though *Plants* are enriched with all the different Virtues, heretofore enumerated, they nevertheleſs are like to a ſtrong Box, which contains an immenſe Treaſure, from which, nevertheleſs, it cannot reap the leaſt Advantage. All thoſe Remedies, proper for all Sorts of Maladies, contained in the *Plants*, cannot cure their own. For Vegetables, like animal Bodies, are ſubject to an infinite Number of Diſtempers, proceeding likewiſe from internal or external Cauſes.

Among the exterior Cauſes of the Maladies of *Plants*, Blaſting deſerves the firſt Place, which proceeding from a Sort of viſcous Humour corrupts the Subſtance of the *Plants*, eſpecially the Legums and Corns, in which 'tis found. Hence, *Virgil, Lib.* I. *Georgic.*

Mox & Frumentis Labor additus, ut mala Culmos,
eſſet Rubigo.

The Vines are alſo ſubject to this Malady.

Next to *Blaſting* is the Dew; when by a too great Abundance of Rain, the Flowers of the Vines are beat down, as well as young *Plants*, which have not yet ſhot forth Roots ſtrong enough to ſhelter them from ſuch Accidents.

Then follows the cold Blaſt, of which *Pliny*, *lib.* 18. *Nat. Hiſt. c.* 28. ſpeaks thus, *Carbunculare*, ſays he, *Vites dicuntur, ut quodam Uredinis Carbone extuſæ*; for *Plants* are imagined burnt, or when the Phlegm, by the cold Nights, is contracted in the Bud of the Vine; or when, by the exceſſive Heat of the Sun, the Fibres of the Leaves, and of the Cluſters of Grapes, are torrified, and thereby obſtruct the Circulation of the nutritious Juice. Theſe, and other-like Maladies, which proceed from the Air, are called *Syderation*.

Vermiculation, which *Pliny* mentions, *lib.* 17. *c.* 24. is nothing elſe than an Irruption of Worms into Trees, by whom they are corroded, eſpecially thoſe which bear the ſweeteſt Fruits, as *Apples*, *Pears*, &c. for the Acerbs, if the Oil be excepted, are not ſo much expoſed to this Malady.

Plants are ſubject to ſeveral other Diſtempers, proceeding from external Cauſes, *viz.* Scabs, Ring-worms, and Decortication, occaſioned by a certain acrimonious Humour, intercepted between the Bark and the ligneous Body, which diveſts Trees of their Bark, eſpecially in the *Spring*.

Trees can alſo be wounded, but their Wounds are not all mortal; for the *Pine*, the *Fir-Tree*, and the *Terebinth*, are eaſed by their Wounds, which procure the Evacuation of Part of their Fat, which otherwiſe would be very troubleſome to them. Others, eſpecially young *Plants*, die, not only by *Section* and *Terebration*,

rebration, but likewiſe by Contuſion and Convulſion, whereby the Texture of the Fibres is lacerated, and therefore the Circulation of the nutritious Juice intercepted, alſo by the Bite of Animals, which affects the ſame nutritious Juice. This is called a violent Death.

Plants ſuffer likewiſe, and ſometimes die, through too great a Heat, or an exceſſive Cold.

There is, almoſt, but one ſole internal Cauſe of the Maladies of *Plants*, *viz.* when Trees, worn out with Age, are deprived of Aliment, by their Veſſels being contracted, or when they cannot retain it, nor diſtribute it to the ſeveral Parts they are compoſed of, through the Imbecillity of their Organs, which is an infallible Prognoſtick of their approaching Death.

BREWING.

BREWING is the Art of preparing Beer and Ale from Malt, which is a Barley cured or prepared to fit it for making thoſe Liquors; therefore, before we proceed further, on the Manner of *Brewing* thoſe different potable Liquors, it is fit we ſhould inform our Readers, how *Malt*, which is the chief Ingredient thereof, is to be prepared.

Sir *Robert Murray* will have ſix *Engliſh* Quarters of good Barley newly threſhed, put in a ſtone Trough full of Water, that it ſwims two or three Inches above the Corn, and 'till the Water be of a bright reddiſh Colour; which will be in about three Days, more or leſs, according to the Moiſture or Dryneſs, Smallneſs or Bigneſs of the Grain, the Seaſon of the Year, or the Temperature of the Weather; for ſome Corn will infuſe, and work more kindly than others. Smooth, plump, weighty Grain does beſt, and will imbibe, or receive the Water more aptly than a hungry, lean, flinty, thin Barley, which muſt be left to the Judgment of the Workman.

As for the Seaſons of the Year, the *Spring* and *Autumn* are the beſt for making of Malt; for in the *Summer* it never makes well, and in the *Winter* it requires longer ſteeping; for, then, five or ſix Days will do it no Harm; when as in warm Weather, three or four Days and three Nights ſuffice, and in moderate Weather three Days and three Nights.

It may be known, when it is ſteeped enough, by other Marks, beſides the Colour of the Water, as by the exceſſive Swelling of the Grain, if it be over-ſteeped, and by too much Softneſs, being, when it is in a right Temper, like the Barley, prepared to make Broth of; which may be eaſily known, by taking the Grain end-ways between the Finger, and gently bruiſing or cruſhing it, for if it is found equally mellow, and that the Huſk opens or ſtarts a little from the Body of the Grain, it is enough. But if the Barley be grown, or any Wet has injured it, it muſt not be ſteeped too much, otherwiſe the Liquor made thereof would have an ill flat Taſte, and would not keep long without growing ſour and dead; for the long keeping of Beer or Ale depends as much on the Goodneſs of the Malt as *Brewing*.

When it is ſufficiently ſteeped, it muſt be taken out of the Trough, and laid on Heaps, to let the Water drain from it, for the better the Water is drained from it, the more equal it will grow or come. If the Quantity of the Grain be large, and the Weather warm, it muſt be laid into two Heaps, but if cold, into one; taking Care, after two or three Hours, to turn it over with a Scoop, and to lay it afterwards in a new Heap, about 20 or 24 Inches deep. This is called the coming Heap, in the right Management whereof lies the principal Skill. In this Heap it may lie forty Hours, more or leſs, (according to the aforementioned Qualities of the Grain, and the Temperature of the Weather) before it comes to the right Temper of Malt. While it lies in this Heap, it muſt be careſully looked to, after the firſt fifteen or ſixteen Hours; for about that Time the Grains begin to put forth Roots, which they do ſooner in the *Spring*, which when they have fully and equally done, the Malt muſt, within an Hour after, be turned over with a Scoop, otherwiſe the Grains will begin to put forth the Blade or Spire alſo, which muſt, by all Means be prevented.

If all the Malt do not come equally, but that which lies in the middle comes the ſooneſt, it muſt be turned ſo as the outmoſt may lie inmoſt, and thus it's to be managed 'till it be all alike. As ſoon as the Malt is ſufficiently come, it muſt be turned over, and ſpread out; beginning, and turning it over and over again, three or four Times. Afterwards, it muſt be turned over, in like manner, once in four or five Hours, making the Heap deeper by Degrees: Continuing ſo to do, for the Space of Forty-eight Hours at leaſt. This frequent turning it over, cools, dries, and deadens the Grain, whereby it becomes mellow, melts eaſily in *Brewing*, and ſeparates entirely from the Huſk.

Some will have it afterwards thrown into a Heap, as high as can be, where it ſhould lie 'till it grows as hot as the Hand can endure it; which uſually comes to paſs in about thirty Hours Space; pretending that it perfects the Sweetneſs and Mellowneſs of the Malt. Others are of Opinion, that by throwing it thus into a Heap, does in ſome Degrees ſuffocate and flatten the Virtues of the Grain, gives to the Liquors made thereof too high a Colour, and impregnates it with Qualities prejudicial to Health, by intoxicating thoſe who drink it, over-heating their Blood, and cauſing the Gravel and Stone, *&c.*

Thoſe who are for heating it, will have it, after 'tis ſufficiently heated, thrown abroad to cool, and turned over-again, about ſix or eight Hours after.

'Tis pretended by ſome, that the Preparation of Malt, from the Trough to the Kiln, is uncertain, and muſt be managed according to the Seaſon of the Year, and the Goodneſs of the Grain; that in moderate Seaſons it will come to the Kiln in three Weeks, or thereabouts; but in cold Weather it may be four or five. The Manner of putting it to the Kiln (which is done on Hair-Cloth, or Wire ſpread under it) varies according to the different Countries; for ſome will put it from ſeven to ten, or 12 Inches thick, which others ſuppoſe to be an ill Cuſtom, and that it never fails to injure the Malt, ſince the ſtrong Fire, which muſt be kept to dry it, is apt to burn that which lies next the Cloth, while that which is uppermoſt, is neither hot nor cold, which muſt flatten its Virtues; that it is impoſſible beſides to dry it equally, and that its Thickneſs occaſions it to ſend forth a moiſt and groſs excrementitious Vapour or Steam, which often re-enters the Malt, gives an ill Taſte to it, and to the Liquor made thereof. Thoſe Perſons would not have the Malt lie on the Kiln thicker than three, four, or five Inches; and a graduate Fire, neither too fierce, nor too ſlow, but indifferent briſk; for, ſay they, when the Fire is too ſlow, it weakens the Malt, and when too fierce, it fires and ſtagnates its Virtues. The beſt Fuel is Peat, or Turf; the next Charcoal; and if there be not enough of one Kind, the beſt muſt be burnt firſt, for that gives the ſtrongeſt Impreſſion.

Malt, while on the Kiln, muſt be turned every two, three, or four Hours, and the Cloth kept clear. The Kiln ought to have convenient Windows for the Evacuation of the groſs Steams, fulſome Damps; and ſtupifying Vapours. Though the beſt Method and moſt natural Manner of drying Malt, is in the Sun, in the Months of *April* and *May*; for thus dried, it yields the paleſt, the moſt wholeſome, and the fineſt Liquor. However this be, Care muſt be taken, that

the Malt be not ſmoaked in the Drying. As to the complexing or colouring of Malt, white is accounted the beſt, becauſe the moſt natural.

From the different Manners of preparing *Malt*, and from its being more or leſs dry'd on the Kiln, Liquors borrow their different Names; for hence they are diſtinguiſh'd into *pale* and *brown*. That which is the ſlendereſt dry'd, tinging the Liquor leaſt, in *Brewing*, is call'd *pale*; and that higher dry'd, and, as it were, roaſted, *brown Malt*. A Mixture of both, makes an Amber Colour. It is certain, that *pale Malt* has more of the natural Grain in it, and is therefore the moſt nouriſhing; but, for the ſame Reaſon, it requires a ſtronger Conſtitution to digeſt it. Thoſe who drink of it are uſually fat, and ſleek in their Bloom; but are often cut off with ſudden Fevers; or if they avoid this, fall early into a diſtemper'd old Age. The *brown Malt* makes a Drink much leſs viſcid, and fitter to paſs the ſeveral Strainers of the Body; but if very ſtrong, may lead on to the ſame Inconveniencies with the *pale*, though a ſingle Debauch wears off much more eaſily in the *brown*. The North Country *Malts*, from *Nottinghamſhire*, *Derbyſhire*, *Leiceſterſhire*, *Cheſhire*, *Lancaſhire*, &c. are the beſt, eſpecially for Ale, but are generally too ſlack dry'd for *March* or *October* Beer, which is to be kept, at leaſt, Half a Year, before it be drank.

The next Ingredient is Water, and he that will *brew* well, cannot be too careful in the Choice of his Water. Sir *J. Moor* ſays, that Pond, and other ſtanding Waters, in fat Ground, if clear and ſweet, make a ſtronger Drink, with leſs *Malt*, than Well, Pump, or Conduit Waters; though any of theſe that are not hungry, and will bear Soap, and lather without breaking, are good. That *Rain* Water, which lathers the beſt of any, if ſav'd from Lead, or where it brings no Salt from the Mortar, over which it may paſs, is good to brew Ale to be drank new, but is not proper for Drinks to be kept long, it being very apt to change, and unleſs kept cool, and in great Quantities, as in the leaden Ciſterns in Cellars, at *Amſterdam*, will corrupt and putrify the ſooneſt of any Water. He ſays, that *Thames* Water, taken up about *Greenwich*, at low Water, where it is free from all Brackiſhneſs of the Sea, and has in it all the Fat and Sullage from *London*, makes very ſtrong Drink; that it will of it ſelf, alone, being carried to Sea, ferment wonderfully, and after its due Purgations, and three Times ſtinking, (after which it continues ſweet) it will be ſo ſtrong, that ſeveral Sea Commanders have told him it would burn, and had often fuddled their Sailors: But I hope he was not ſimple enough to believe them. Though, at the ſame Time, he thinks *Thames* Water by no Means fit to *brew* ſtrong Beer to keep, becauſe he had found the Drink *brew'd* of it, though never ſo clear, apt, on any conſiderable and ſudden Change of Weather, to ferment, and grow ſoul; taking it for a Rule, that no Malt Drink is truly good, which is not perfectly fine. However, he concludes, that the beſt Liquor to *brew* with, is that taken from a ſmall clear Rivulet, or Brook, undiſturb'd by Navigation, or Fording, and taken up in dry Weather, when no Rain has lately waſh'd the Banks; adding, that his two firſt *Brewings* were made of ſuch Water, which, with all his Care and Experience, he could never equal ſince, though he had been very nice, and had ſent ſome Miles for his Water. He pretends, that the beſt Water in *England* is that at *Caſtleton* in *Derbyſhire*, commonly call'd the *Devil's Arſe*, &c. which ouzes from a great Rock cover'd over with ſhallow Earth, and ſhort Graſs a-top. He is alſo of Opinion, that there is ſome Water which will never make good *Ale*, or *ſtrong Beer*.

Dr. *Quincy* obſerves, on the contrary, that the beſt *pale Malt Liquors* are thoſe *brew'd* with hard Waters; as thoſe of Springs, and Wells; in regard the mineral Particles, wherewith theſe Waters are impregnated, help to prevent the Cohеſions of thoſe drawn from the Grain, and enable them to paſs the proper Secretions the better; as the viſcid Particles of the Grain do likewiſe defend theſe from doing the Miſchief they might otherwiſe occaſion. Though the Doctor agrees with Sir *J. Moor* in this, that Rain and River Waters ſeem beſt ſuited to draw out the Subſtance of high-dry'd *Malts*, which retain many fiery Particles in their Contexture, and are therefore beſt loſt in a ſmooth Vehicle.

The third Ingredient is *Hop*, which Sir *J. Moor* thinks beſt when about a Year old. In the Uſe of *Hops* conſiſt chiefly the Differences of *Malt Liquors*; for thoſe *hopp'd* are call'd *Beer*, and thoſe *unhopp'd Ale*. The Difference made by *Hop* is beſt diſcover'd, from the Nature and Qualities of the *Hops* themſelves; theſe are known to be a ſubtile grateful Bitter, in their Compoſition therefore with this Liquor, they add ſomewhat of an alkaline Nature, *i. e.* Particles which are active, ſublime, and rigid; by which Means the ropy, viſcid Parts of the Malt are more divided, and ſubtiliz'd; and are, therefore, not only render'd more eaſy of Digeſtion and Secretion in the Body; but alſo, while in the Liquor, prevent it from running into ſuch Cohеſions as would make it ropy, vapid, and ſour. For want of this, in *unhopp'd Drinks*, that clammy Sweetneſs which they retain after working, ſoon turns them acid, and unfit for Uſe; which happens ſooner or later, in Proportion to the Strength they receive from the *Malt*, and the Comminution it has undergone by Fermentation.

The Proportion of *Hops* may be Half a Pound to an Hogſhead, of ſtrong Ale; one Pound to a Hogſhead, of ordinary ſtrong Beer, to be ſoon drank out; and two Pounds to a Hogſhead, of *March*, or *October* Beer; and for the After-worts, which are not to be kept long, what comes from the firſt Wort, will ſerve well enough to boil again with them. If a greater Proportion of *Hops* be put into the firſt Wort, and are boil'd all the while the Wort boils, it will make it bitter; but Sir *J. Moor* thinks it beſt to double the Proportion, by taking out the firſt Parcel, when the Wort has boil'd Half the Time 'tis deſign'd it ſhould, and then adding the ſame Quantity of freſh *Hops*, to continue boiling till the Wort be taken out of the *Copper*. This will ſomewhat increaſe the Charge, which will be very inconſiderable, if the *Hops* are bought in a cheap Year.

Five Gallons of Drink muſt be proportion'd to every Buſhel of *Malt*, *i. e.* (avoiding Fractions) eleven Buſhels of *Malt*, to every Hogſhead of *Ale* or *Beer*. But it muſt be obſerv'd, that in ſo great a Diſproportion of *Malt-Drink*, as eight to five, almoſt a Third of the Liquor, in the firſt Wort, will be abſorb'd by the *Malt*, never to be return'd; and that an Allowance is to be made of about a ſixth Part, to *evaporate* in boiling: So that if it be expected to clear a Hogſhead of Drink, that is, fifty-four Gallons, from the firſt Wort, there muſt be put into the *Maſh-Tub* near ninety Gallons of Liquor; but for the ſecond and third Wort, the Goods being wet before, no more Liquor is wanted, but what's intended to make Drink, except an Allowance of about a tenth Part for Waſte, this not boiling ſo long as the firſt Wort; and of this ſecond Wort may be made a Hogſhead of good middle *Beer* or *Ale*, as ſtrong as the common Ale-houſe Drink in *London*. The third Wort will make one Hogſhead of good *Small Beer*. In ordinary *Brewing*, ſix or ſeven Buſhels of *Malt* will make one Hogſhead of good ſtrong, and another of *Small Beer*; and in ſuch Caſe, two *Moakſes* will as well take out the Strength of the *Malt*, as three in the other.

Having thus provided all the neceſſary Ingredients for *Brewing*, diſcover'd their different Qualities and Quantities; we ſhould go to work, which cannot be done before we have provided our ſelves with the neceſſary Utenſils; which conſiſt in a *Copper*, *Maſh-fat*, *Receiver*, or *Under-back*, *Rudder*, *Lead*, or *Pump*, *Hand-jet*, in *Coolers*, or *Cool-Backs*; *Tubs*, *Tuns*, &c.

All theſe Utenſils ſhould always be kept very clean, eſpecially the *Maſh-fat*, *Coolers*, *Tuns*, *Tubs*, &c. and waſh'd well with cold Water, which is better than hot;

hot; for boiling Water drives back into the Wood a certain ſour, fulſome Quality, which the former Wort has left behind; which Sourneſs communicates it ſelf to the next Wort, and impregnates it with that ſharp Quality call'd *Pricks*, which is often the Occaſion why Brewers *Ale*, in hot Seaſons, will not keep above four or five Days, or thereabouts; which Inconveniency could be eaſily prevented, by keeping the Veſſels clean. Thoſe that *brew* only for their own private Family, ſhould have their *Maſh-fat*, and *Coolers*, *copper'd* or *tinn'd* over; which, in ſome Meaſure, would prevent the ſouring or *pricking* of their *Ale*, in Summer.

For *March*, or *October Beer*, it is adviſeable to have large Veſſels bound with *Iron Hoops*, containing two, three, or four Hogſheads, according to the Quantity intended to be made, putting all into one Veſſel; that ſort of Drink digeſting, and mellowing beſt, in the largeſt Quantities. If the Veſſels were not *iron hoop'd*, the *March Beer* would be in Danger to be loſt, or ſpoil'd.

At preſent, that we are provided with all the Implements neceſſary for *Brewing*, we'll begin the Operation by putting our Liquor into our *Copper*; which done, we'll ſtrew a Handful or two of Bran, or Meal, upon it, not ſo much to ſtrengthen our Liquor, as to make it heat quickly; for ſimple Water, alone, is long ere it boils. As ſoon as we perceive the Liquor ſimmer, (to avoid a needleſs Expence of Fuel and Time, firſt to make it too hot, and after to ſtay till 'tis cooler again) we'll take it out of the *Copper*; for we muſt by no Means mix our *Malt* with boiling-hot Liquor, which would make the *Malt* clot, and cake together, and the moſt flow'ry Parts of it run whitiſh, glewy, and fizy, like Sadlers Paſte; ſo that it would never mix kindly, nor give out its Strength equally to the Liquor.

Others give for Reaſon of not mixing the *Malt* with boiling-hot Liquor, that Boiling *evaporates* the natural Spirit of the Water, renders it harſh and hard, and thereby not capable to extract the Goodneſs of the *Malt*.

Some put their *Malt* firſt in the *Maſh-fat*, and then pour in their Liquor for the firſt Wort; but as we are reſolv'd to follow Sir *J. Moor*, we'll pour in our Liquor firſt, for our firſt Wort, for theſe Reaſons: Becauſe we could never otherwiſe gueſs when our Liquor is cool enough to be mingled with our *Malt*; but in this we have a Rule to guide our ſelves by, which is that we muſt let our Liquor remain in the *Maſh-fat* till the Vapour from it be ſo far ſpent, that we may ſee our Face in the Liquor; and then pouring the *Malt* upon it; we have this further Advantage, that we can keep our Liquor longer hot, and it will ſink gradually, diſtributing its Strength to the Liquor equally, without matting; and if it does not deſcend faſt enough of it ſelf, we'll preſs it down with our Hands, or *Rudder*, with which we uſe to ſtir our *Moaks*. This muſt be done by Degrees, always remembering that we ſhake our Sacks before we remove them, over the Sides of the *Maſh-fat*, to get out the Flower of the *Malt* which ſticks to them. And after all the *Malt* is ſettled, and the Liquor appears above it, we muſt put into the *Maſh-fat* as much more hot Water out of the *Copper*, as will make in all ninety Gallons for one Hogſhead; then we'll ſtir it, almoſt without ceaſing, till it has been in the *Maſh-fat* about two Hours from the firſt putting up the *Malt*, in which our Servants may help, and relieve one another.

After this, we'll pull out the Rudder, and putting a little dry *Malt* a-top, we'll cover it cloſe, and leave it to ſtand Half an Hour undiſturb'd, that it may run off clear, and the *Malt* being ſunk to the Bottom, the Liquor a-top will run through it all again, and bring away the Strength of it. After this, we muſt lift up our *Tap-ſtaff*, and let out about a Gallon; not into the Tub underneath, or under Back, which is to receive the Wort, but into the Long-handle Jet, and put it back again, ſtopping the *Tap-hole*: We'll do this two or three Times, till we find it runs clear, which it will not do at firſt, though our *Tap-hole* is never ſo well adjuſted. Through the whole Courſe of the *Brewing*, we'll be very careful to do all we can to *promote* the Fineneſs and Clearneſs of the Drink. In the *North* of *England*, where much the beſt *Malt-Drink* is made, they are ſo careful of making their Drink fine, that they let their firſt *Wort* ſtand in the Receivers till it is very clear, all the groſs Parts being ſunk to the Bottom; this they continue to do about three Hours in Summer, and ten or twelve Hours in the Winter, as Occaſion requires, which they call *blinking*; after which, leaving the Sediment behind, they only lade out the Sediment into the *Copper*; which Cuſtom is peculiar to the *North*, and wholly unpractiſed in other Parts.

When all is run out into the Receivers, or Underback, we'll lade, or pump out our ſecond Liquor, order'd ſo as to be juſt then ready to boil, on our *Moaks*; and putting the firſt Wort into the *Copper* again, we'll let it boil reaſonably faſt (which Boiling will be accelerated by the *Hops* put on it) for about an Hour and a Half, for *March*, or *October* Beer, to be kept long; and an Hour for ſtrong *Ale* to be drank new. But *Wort* muſt rather boil reaſonably faſt, than to ſtand long to ſimmer; becauſe common Experience ſhews, it waſtes leſs, and ferments better, after ſo long boiling, than ſimmering.

Our firſt Wort being thus boil'd, muſt be *pump'd*, or laded off into one or more *Coolers*, or *Cool-backs*, in which we'll leave the Sullage behind, and let it run off fine; the more *Coolers*, and the thinner it ſtands, and the ſooner it cools, (eſpecially in hot Weather) the better. We'll let it run from the *Cool-backs* into the *Tun*, very cool, and will not ſet it there to work, in Summer, till 'tis as cool as Water; in Winter it muſt be near Blood-warm; at leaſt the Bowl, in which we put the Yeaſt, to ſet the reſt on working, muſt have a Mixture of Wort hot enough to make it all ferment. When we find that it begins to work up thick to a Yeaſt, we'll mix it again with our *Hand-jet*, and when it has work'd it ſelf a ſecond Time to a Yeaſt, (if we deſign it for *Ale*, and ſpeedy Drink, and *hop* it accordingly) we'll beat in the Yeaſt every five Hours, for two Days together, in Summer, or more, according as the Weather is; and for three or four Days, in Winter; covering the *Fat* cloſe, that it falls not into the working Tun. When the Yeaſt begins to work ſad, and upon turning the Concave of the Bowl downward, ſticks faſt to the Inſide, ſkimming off, then, the Yeaſt firſt, we muſt clean the reſt into the Veſſel, leaving all the Dregs in the Bottom of the Tun, and putting only the clean up. After it has a little fermented in the Veſſel, we'll find it, in a few Days, fine, and fit to drink; though, according to the Quantity of the *Hops*, we may proportion it for longer keeping. If we *brew* in *March*, or *October*, and have *hopp'd* it for long keeping, we muſt then, upon its ſecond working to a Yeaſt, (after once beating in) cleanſe it into the Veſſel with the Yeaſt in it, filling it ſtill, as it works over, and leaving, when we ſtop it up, a good thick Head of Yeaſt to keep it.

Some make their firſt Wort in this Manner: They make their Liquor near boiling-hot, as above mention'd, then pour juſt ſo much into their *Maſh-fat* as will wet their *Malt*, which they ſtir, and let ſtand Half an Hour, which they pretend prepares the *Malt* the better to communicate its Strength to the Liquor; they afterwards pour the whole Quantity of Liquor over the *Malt*, and let it ſtand an Hour and a Half, or two Hours, if they want to have their firſt Wort very ſtrong, and the Seaſon be not too hot: Then they put what Quantity of *Hops* they think proper into their Receivers, and let their Wort run to them; and after their *Hops* have infuſed an Hour and a Half in their Wort, they ſtrain it off into the *Coolers*, and thus pretend to have perfected their firſt Wort. Then they put upon the *Malt* their ſecond Liquor, near as hot as the firſt, rather cooler, if there be any Difference, which they let ſtand on the *Malt* no longer than an

an Hour, at moſt; then take what Qcantity they pleaſe of freſh *Hops*, which they put into their Receivers as before, and let the ſecond Wort run to them; then take both ſecond Wort, and *Hops* together, and put it into the *Copper*, where they let them infuſe till the Wort is near boiling, and then ſtrain this, alſo, into the *Coolers*.

Others boil a Quantity of Water, which is left to cool till the Height of the Steam be over; then pour ſo much to a Quantity of *Malt* in the *Maſhing-Tub*, as makes it of a Conſiſtence ſtiff enough to be juſt well rowed up: After ſtanding thus a Quarter of an Hour, a ſecond Quantity of the Water is added, and rowed up, as before. Laſtly, the full Quantity of Water is added, and that in Proportion as the Liquor is intended to be ſtrong, or weak. This Part of the Operation they call *maſhing*. The whole now ſtands two or three Hours, more or leſs, according to the Strength of the Wort, or the Difference of Weather, and is then drawn off into a Receiver, and the Maſhing repeated for a ſecond Wort, in the ſame Manner as for the firſt; only the Water to be cooler than before, and not to ſtand above Half the Time.

They then mix the two Worts, add the intended Quantity of *Hops*, and cover the Liquor cloſe, boiling it in a *Copper* for the Space of an Hour, or two; then they let it into the Receiver, and the *Hops* ſtrain'd from it into the Coolers; when cold, they apply the Yeaſt, or Barm, and leave it to work, or ferment, till it be fit to tun up.

It is pretended, that *March* is the beſt Month for *Brewing*, and the Water, then, better than in *October*; but Sir *J. Moor* ſays, that he has always found, that the *October Beer*, having ſo many cold Months to digeſt in, proves the better Drink by much; and requires not ſuch watching, and tending, as the *March Beer* does, by being oblig'd to open and ſtop the Hole on every Change of Weather. The ſame Gentleman has no very great Opinion of thoſe *ſtale Beers* which are kept, as pretended, five, ten, or more Years; though he believes that more *Malt* and *Hops*, than he propoſes, will keep Drink longer than he uſed to do; but he believes, alſo, that ſuch *Beer* will not exceed his in any good Qualities. He ſays, again, that he always broach'd his at about nine Months End; his *March Beer* at *Chriſtmas*, and his *October* at *Midſummer*; at which Time he ſuppoſes it generally the beſt; and likewiſe, that it would keep very well in Bottles a Year or two more.

The Veſſel, where the *Beer* is kept in, muſt be ſtopp'd cloſe with Cork, not Clay; and there muſt be manag'd near the Bung-hole a little Vent-hole, ſtopp'd with a Spile, which is never to be pull'd out till we bottle or draw off a great Quantity together; by which Means it is kept ſo cloſe ſtopp'd, that it fluſhes violently out of the Cock, for about a Quart, and then ſtops on a ſudden, and perles, and ſmiles in a Glaſs like any *bottled Beer*, though in Winter; but if once the Vent-peg is pull'd out to draw a Quantity at once, it will ſenſibly loſe this Briſkneſs, and be ſome Time before it recovers it.

For *ſmall Beer*, there is a third *Maſhing*, with the Water near cold, and not left to ſtand above three Quarters of an Hour, to be *hopp'd* and *boil'd* at Diſcretion; though the beſt *Gourmets*, in *Malt-Drink*, conſider this third Liquor as pernicious to Health; for the two firſt having extracted the whole Strength and good Qualities of the *Malt*, there remains nothing but a dull, heavy, and groſs Phlegm, of a tart, ſour Nature, which impregnates the Liquor, and gives it (if any Taſte at all) a very ill, and unpalatable Taſte; which bad Qualities are heighten'd, by boiling it ſtoutly with the Dregs of the *Hops*, for the boiling of *Hops* entirely ſuffocates and deſtroys the few good remaining Qualities of the *Malt*, and there remains nothing after ſuch boiling, but a harſh, bitter Aſtringent, which ſuch ſmall Wort extracts in the boiling.

Therefore the beſt *Small*, or *Table Beer*, is made by adding a larger Proportion of Liquor to the *Malt*, (according as one would have it) and then mixing the firſt and ſecond Wort equally together.

I have read a *Chymical Brewer*, who will not have the Wort boil'd after drawn off the *Malt*; pretending, that it is not Boiling, but a due Fermentation, that makes good Liquor; comparing *Beer* to Wine and *Cyder*, which are made without Boiling: But this Compariſon is ſo very lame, and his Reaſons ſo frivolous, that I'll forbear teazing my Readers with them; though he pretends to have made excellent *Beer*, and which has kept good for a whole Year, though it had never boil'd.

Sir *J. Moor* ſays, that the Reaſon why publick and common *Brewers* ſeldom or never *brew* good Drink is, that they wet more *Malt* at once than 'tis poſſible they can have Veſſels and Servants enough to work, and ſet it cool enough to ferment kindly; and withal *brew* ſo often, that they cannot ſufficiently, between one *Brewing* and another, cleanſe and ſcald their *Brewing-Veſſels*, and Barrels, giving them due Time to dry; but that they will retain ſuch a Ruſt (as I have obſerv'd already) as will always *char* and *ſour* their Liquor. My *Brewers*, ſays he, have been ſo cautious in this Particular, that if any Servants had, by Accident, made Uſe of any *Long-handed Jet*, *Hand-Jet*, or *Pail*, waſh'd with cold Water, during the *Brewing*, they would ſcald it a-new, and let it dry, before they would uſe it again.

Malt-Liquors have different Qualities, or Virtues, according to their different Preparations. For Example, It is a common Opinion, that *Ale* is more diuretick than *Beer*; that is, *unhopp'd* Liquor, more than that with *Hops* in it; which may hold in ſome Conſtitutions, in regard *Ale* being more ſmooth, ſoftening, and relaxing, where Urine is to be promoted by enlarging the Paſſage, as in thin dry Conſtitutions, this is the moſt likely to effect it. But where the promoting of Urine is to be done by attenuating and breaking Juices, to render them more fluid, it is certainly beſt anſwer'd by thoſe Drinks which are well *hopp'd*.

Dr. *Quincy* is of Opinion, that there is little Reaſon to think (though 'tis the common Belief) that *Hops* tend to breed the Stone; and, in the general, makes no Scruple to ſay, that for one Conſtitution damag'd by *Beer*, there are Numbers ſpoil'd by *Ale*; for this laſt manifeſtly fouls the Glands, ſtuffs the Veſſels with Slime and Viſcidity, makes the Body unweildy, and corpulent, and paves the Way for Cachexies, Jaundice, Aſthma's, and, at laſt, incurable Dropſies. The urinary Paſſages, alſo, which it is ſuppos'd to clear, will, in Time, be fill'd with Slough, and Matter, of as ill Conſequence as Gravel.

The different Strength of Malt-Liquors makes alſo their Effects different. The ſtronger they are, the more viſcid Parts they carry into the Blood, and tho' the ſpirituous Parts make theſe imperceptible at firſt; yet when theſe are evaporated, which will be in a few Hours, the others will be ſenſibly felt by Pains in the Head, Nauſeouſneſs in the Stomach, and Laſſitude, or Liſtleſneſs to Motion. This, thoſe are the moſt ſenſible of, who have experienced the Extremes of drinking thoſe Liquors, and Wine; for a Debauch of Wine they find much ſooner wore off, and they are much more lively and briſk afterward, than after fuddling Malt-Liquors, whoſe viſcid Remains will be long e'er they are ſhook off. Malt-Liquors, therefore, are more wholeſome for being ſmall; *i. e.* of ſuch a Strength as is able to carry a ſmall Degree of Warmth into the Stomach, but not ſo great as to prevent their being proper Diluters of the neceſſary Food. Indeed, in robuſt People, or thoſe who labour hard, the Viſcidities of the Drink may be broke into convenient Nouriſhment; but in Perſons of another Habit, and Way of Living, they ſerve rather to promote Obſtruction, and ill Humours.

The Age of Malt-Liquors is the laſt Thing by which they are rendered more or leſs wholeſome.

A
Rustick Door:
Tuscan Door:
Dorick Door:
Ionick Door.
B
Dorick Window
Ionick Window
Rustick Window
Dorick nich on Pedestal
Nich adorne
Rustick.
Chimney Pieces.
Ceiling Piece.
Strait Flyers
Square Flyers
C
Mixed Stairs
Flat Roof
D
Winding Stairs.
B. Cole. Sculp.

Age ſeems to do nearly the ſame Thing as Hops; for thoſe Liquors which are longeſt kept, are certainly leaſt viſcid: Age breaking the viſcid Parts, and by Degrees rendering them ſmaller and fitter for Secretion. But this is always determined according to their Strength; in Proportion to which, they will ſooner or later come to their full Perfection, as well as Decay; for when Ale or Beer is kept 'till its Particles are broke, and comminuted as far as they are capable, then it is that they are beſt; and beyond this they will be continually on the Decay, 'till the finer Spirits are entirely eſcaped, and the Remainder becomes vapid and ſour. The Vulgar are little or nothing ſenſible of all the fatal Conſequences attending the exceſſive Drinking of Malt-Liquors; elſe they would never ſpend the Subſtance of their Family, in impairing their Health, and often entirely ruinating their whole Conſtitution in an Alehouſe, where they ſpend in few Hours of Guzzling, what they have work'd for, like Slaves, during a whole Week, often when innocent Babes, and a diſconſolate Wife, are ſtarving at Home; who are not only robbed of their daily Subſiſtence, by ſuch Spunges, but are alſo expoſed to the imminent Danger of being forced, at laſt, to find a Remedy, for what has been the Cauſe of their Ruin, and to have the Diſpleaſure to ſee always a perfidious Wretch deprived of his Reaſon, or of his Health, or rather never reaſonable, but when his Reaſon can be but of very little Service to him, or to any Body elſe. What ſurprizes me moſt is, that Perſons, who call themſelves Gentlemen, are addicted to that ſcandalous Vice, of loſing often their Reaſon in a Pot of ſtrong Beer. Even our Brethren Authors (I mean thoſe of an inferior Claſs) are not free of it; and I know ſome, who are never better pleaſed, but while they have a Pot at their Noſe, and would almoſt think it a Crime to paſs an Alehouſe without calling; which, in my Opinion, is a very great Scandal to the Profeſſion; 'tis through that the Pleaſure of haranguing the Mob, in a Dialect, which often, neither the Orator, nor Auditor underſtand, is a great Inticement to it.

BUILDING.

BUILDING, in the Senſe we take it here, is the Art, or Act of conſtructing an Edifice; in which Senſe it comprehends as well the Expences, as the Intention, and Execution of the Deſign thereof.

Vitruvius tells us, that in every Fabrick three Things are requiſite; *viz. Conveniency*, *Strength*, and *Beauty*; for without them no Building can merit our Eſteem or Approbation. 1. That Edifice which is defective in Strength, though made never ſo commodious; or which is never ſo ſtrong and commodious, if it wants Beauty, cannot juſtly be called perfect. It will be commodious, if every Member, or Part of it, ſtands in its proper Place, a due Regard being had to Dignity and Uſe; as for Example, when the Galleries, Hall, Chambers, Cellars and Garrets, are artfully diſpoſed.

2. The Strength conſiſts, 1. In carrying up all the Walls directly regular, which will be done, by making them thicker below than above; and their Foundations firm and ſolid. 2. By taking Care to fix the upper Columns directly perpendicular over thoſe below; and to make all the Openings, as Doors, and Windows, exactly over one another, ſo that the ſolid may be directly over the ſolid, and the void over the void.

3. The Beauty will ariſe from the Harmony and Correſpondence between the whole, and its various Parts; and of the various Parts between themſelves; for then the Building will appear one compleat and perfect Body, in which one Member anſwers to another; and altogether to the whole; ſo that it may ſeem abſolutely neceſſary to its Exiſtance.

Upon a due Examination of all theſe Particulars, upon the Model or Draught (Sir *H. Wotton*, being of Opinion, that a Model, made of Paſteboard, or Wood, as plain and unadorned as poſſible, to prevent the Eye's being impoſed on, is beſt, and the bigger this Model, the better) an exact Computation muſt be made of the whole Charge; and a timely Proviſion made of the reſpective Materials which are requiſite; which Materials are Stones and Wood; Lead, Bricks, or Slates, for the Covering; Lime, Sands, Plaiſter, *&c.* The Stones, are Marble, Free-Stones, Bricks for the Walls, *&c.* The Wood, are Firr, Cypreſs, Cedar, *&c.* For Poſts and Pillars of upright Uſe; Oak for Beams, Summers, and Joining and Connection. With theſe neceſſary Precautions, a Building will be carried on with Vigour; for if the Materials are got in due Time, the Building will deſerve Commendation; and the Walls being thereby worked up equally, and without Interruption, will ſettle in the like Proportion, and without thoſe Crannies which are found in Edifices built only by Fits and Starts.

But as there is ſome Art in the Choice of the Materials above-mentioned, and that, of their Goodneſs, depends in Part the Decoration of the whole Fabrick, as well as its Elegance; it will not be improper to inſtruct here, our Pupil Architect, how to make that Choice; beginning by the Stones, as the principal Material, and which we have divided into Marble, Free-ſtone, Bricks, *&c.*

MARBLE is a precious Kind of Stone, found in great Maſſes, dug out of Pits and Quarries, being of a Conſtitution ſo hard and compact, and again ſo fine, as readily to take a beautiful Poliſh; much us'd in Ornaments of Buildings, as Columns, Chimney-Pieces, Tables, *&c.*

The Goodneſs of *Marble*, and its Beauty, proceeds chiefly from the different Quarries 'tis dug out of.

The general Diviſion of *Marbles* is into antient and modern *Marbles*. Antient *Marbles*, which were certainly the beſt, are thoſe whoſe Quarries are loſt, and whereof we have only ſome Pieces remaining. The Modern are thoſe, whoſe Quarries are ſtill open, and out of which Blocks continue to be dug; and of theſe there are ſeveral Sorts, all different in Beauty and Goodneſs; between which an able Architect ſhould know how to make the Difference. The beſt we have, at preſent, is imported from *Italy*; for the Quarries of *Parian Marble*, ſo much celebrated in Authors, and which the greateſt Part of the *Grecian* Statues were made of, are loſt.

Among thoſe imported from *Italy*, thoſe from the State of *Genoa* deſerve the Preference; though, even of them, there are ſeveral Sorts, *viz. Marble of Carrara*, which is very white. *White veined Marble*, which has large Veins, with grey and blue Stains on a white Ground. *Blue Turquin Marble*, mixed with a dirty Kind of white. *Modern green Marble*, improperly called *Egyptian*, of a deep green, ſpotted with grey. Theſe three Sorts come from *Carrara*, on the Coaſt of *Genoa*, and are very good.

The other *Marbles* from *Italy* are, the *Marble* of *Porta Santa*, called, at *Rome*, *Serna*; which is mingled with large Clouds, and Veins of red, yellow, and grey. *Marble* of *Breſs*, yellow with white Spots. *Portor Marble*, which has a black Ground, with Clouds, and Veins of yellow. *Marble fior di Perſica*, which conſiſts of white and red Stains, ſomewhat yellowiſh. *Marble Ochio di Pavone*, or *Peacock's-Eye*, mingled with red, white, and blueiſh Clouds, ſomewhat reſembling the Eyes at the End of the Peacock's Tail.

Tail. *Marble of Sicily*, which is a browniſh red, ſtained with oblong Squares, of white, and *Iſabella*, like ſtriped Taffaty. *Marble* of *Savoy*, which is a deep red, mixed with other Colours; each Piece whereof ſeems cemented on the reſt. *Cypollino*, or *Cipollin Marble*, of a Sea-green Colour, mixed with large Waves, or Clouds of white or pale green. *Scamozzi* takes this to be the ſame with that which the Antients called *Auguſtum & Tiberium Marmor*; becauſe diſcovered in *Egypt* in the Time of *Auguſtus* and *Tiberius*.

Spain produces likewiſe ſome very good *Marbles*, viz. the *Brocatella Marble*, which is mingled with little Shades of *Iſabella*, yellow, pale, and grey; and comes from *Tortoſa*, where it is dug out of an antient Quarry. *Marble* of *Signam*, in the *Pyreneans*, of a greeniſh brown, with red Stains; though this is ſomewhat various in its Colours. *White Marble*, that dug out of the *Pyreneans* on the Side of *Bayonne*.

The *French* have alſo Quarries of *Marble* in ſeveral of their Provinces, as in *Auvergne*, which produces a pale red Marble, mingled with violet, green, and yellow. *Languedoc*, which produces *Marble* of a vivid red, with large white Veins, or Stains; there is ſome borders pretty much on the blue, but this is of leſs Value. The *Marble* of *Barbançon*, in *Hainault*, is black, veined with white. That of *Dinom*, near *Liege*, is of a pure black, very beautiful, and very common. That of *Namur* is black, likewiſe, but leſs beautiful, as inclining a little to the blue, and traverſed with little Streaks of grey; this is very common, and frequently uſed in Paving. The *Marble* of *Guachenet*, near *Dinant*, is of a reddiſh brown, with white Spots and Veins. That of *Rance*, in *Hainault*, is of a dirty red, mixed with blue and white Clouds, and Veins; this is pretty common, but is different in Degree of Beauty.

We have, in *England*, *Engliſh white Marble*, veined with red. *Derbyſhire Marble*, variouſly clouded, and diverſified, with brown, red, yellow, &c.

Laſtly, *Marbles* are divided into *rigid*, *fibrous*, *brittle*, and *terracy Marbles*.

The *rigid Marble* is that, which being too hard, works with Difficulty, and is liable to ſplinter, as the black of *Namur*. The *fibrous* is that full of Threads or Filaments. The *brittle*, that which crumbles under the Inſtrument; and the *Terracy Marble*, that with ſoft Places in it, which muſt be filled up with Cement. Theſe two laſt Kinds are not to be choſen where others can be had, no more than thoſe *Marbles* which have the Grain too coarſe, nor thoſe full of Nails, which anſwers to the Knots in Wood; or with *Emeril*, which is a Mixture of Copper, or other Metals, forming black Stains in the *Marble*, and rendering it diſagreeable to the Eye, eſpecially white *Marble*, to which the *Emeril* is peculiar. The Nails augment the Difficulty in cutting and poliſhing the *Marble*.

For STONE, here, in *England*, that dug in the *Peninſula* of *Portland*, and thence called *Portland-Stone*, is much uſed, being ſofter, and whiter than *Purbeck Stone*, and is commonly raiſed out of the Quarries in bigger Blocks than that. The *Ryegate Stone*, called alſo *Fire-Stone*, is good, and much uſed for Chimneys, Hearths, Ovens, and Stoves.

Bricks, among us acquire various Names, according to their Form, Dimenſions, Uſes, Method of making, &c. The Principal are compaſs *Bricks*, of a circular Form, uſed in ſteening of Walls. *Concave*, or *hollow Bricks*, on one Side flat, like a common *Brick*, on the other hollowed; uſed for conveying Water under-ground. *Cogging-Bricks*, uſed for making the indented Works under the Coping of Walls, built with great *Bricks*. *Coping Bricks*, formed on Purpoſe, for coping of Walls. *Dutch* or *Flemiſh Bricks*, uſed to pave Yards and Stables, and for Soap-boilers Vats and Ciſterns. *Clinkers*, ſuch *Bricks* as are glazed by the Heat of the Fire in making. *Feather-edg'd Bricks*, like the common Statute *Bricks*, only thinner on one Edge than on the other, and uſed to pen up the Brick-Pannels in Timber Buildings. *Great Bricks*, are thoſe which are twelve Inches long, ſix broad, and three thick: The Weight of one being about 15 Pounds, ſo that 100 weigh 1500, and 1000 of them 15000 Pounds: Their Uſe is to build Fence-Walls, together with *Pilaſters*, or *Buttreſs Bricks*, which are of the ſame Dimenſions with the great *Bricks*, only they have a Notch at one End, half the Breadth of the *Brick*; their Uſe is to bind the Work at the *Pilaſters* of Fence-Walls, which are built of great *Bricks*. *Paving-Bricks* or *Tiles*, are of ſeveral Sizes in ſeveral Countries and Places. *Place-Bricks*, ſuch as are made in a Place on Purpoſe for them, near the *Building* they are to be uſed in. *Statute* or *ſmall common Bricks*, when burnt, ought to be nine Inches long, four and a Quarter broad, and two and a half thick. 100 of theſe uſually weigh about 550 Pounds, and 1000 5500 Pounds; about 407 makes a Ton Weight. Theſe are commonly uſed in paving Cellars, Hearths, Sinks, &c. 30, or 32, if true Meaſure, will pave a Yard Square, and 330 will pave a Square of 100 Foot laid flat; but if laid Edge-ways, there muſt be near double the Number. *Stock-Bricks* are to be of the ſame Dimenſions, only $\frac{1}{8}$ of an Inch thicker.

Barbaro, in his Commentary on *Vitruvius*, recommends another Form of *Bricks*, *viz.* Triangular ones, every Side a Foot long, and only an Inch and half Thick. Theſe, he obſerves, would have many Conveniencies above others, as being more commodious in the Management, of leſs Expence, and of fairer Shew; adding much Beauty and Strength to the Mural Angles, where they fall gracefully into an indented Work. Sir *H. Wotton* wonders they have never been taken into Uſe; being recommended by ſo great an Authority.

The *Bricks* uſed by the *Greeks* were principally of three Kinds, the firſt called διδωρον, *i.e.* of two Palms; the ſecond τετραδωρον, of four Palms; and the third πενταδωρον, of five Palms. They had other *Bricks*, juſt half each of theſe, which they joined together to render their Work more ſolid, as well as more agreeable to the Eye, by the Diverſity of Figures, and Sizes of the *Bricks*.

The MATERIAL, which comes next under the Conſideration of our Architect, is *Lime*, which is a white, ſoft, friable Subſtance, prepared of *Stone*, *Marble*, *Free-Stone*, *Chalk*, or other ſtony Subſtance, by burning in a Kiln. That which is ſuch as it comes from the Kiln or Furnace, is called *Quick-Lime*; and that diluted, or drenched in Water, *ſlack'd Lime*.

Palladio ſays, that the beſt *Lime* is made of the hardeſt, ſoundeſt, and whiteſt Stone, and which remains a third Part lighter after 'tis burnt than the Stones 'twas made of. He obſerves alſo, that Stones collected up and down, and which have been expoſed a long Time to the Injuries of the Weather, are not ſo proper to make Lime with, as thoſe which are newly dug out of the Quarry; nor thoſe taken from a dry Pit, ſo good as thoſe from a moiſt and ſhady one. That ſuch Pebbles as are found in Rivers and rapid Streams are excellent for Lime, and make very white, neat, and ſmooth Work; on which Account it is principally uſed in the rough Caſting of Walls. That all Stones, whether thoſe taken from the Hills, or from the Rivers, burn faſter or ſlower, in Proportion to the Fire, which is given them; but that for the Generality, they are burnt in threeſcore Hours.

Dieuſſant recommends *Lime* made of Sea-Shells as the beſt; but *Goldman* finds Fault with it, as being impatient of Moiſture, and therefore eaſily peeling off from the Outſide of Walls.

Good *Lime* may alſo be made of Mill-ſtone, not coarſe, and ſandy, but fine, and greaſy; and Sir *H. Wotton* finds Fault with the *Engliſh* for making *Lime* as they do, of Refuſe and Stuff without any Choice; whereas the *Italians*, at this Day, and much more the Antients, burnt the firmeſt Stones, and even Fragments of Marble, where it was plentiful; which in Time became Marble again for its Hardneſs; as appears in their ſtanding Theatres, &c. We have two Kinds of *Lime* in common Uſe in *England*, the one made

made of hard Stone, the other of a ſoft, calcarious, or chalky Stone; whereof the former is much the ſtrongeſt. That made of ſoft Stones, or Chalk, is fitteſt for plaiſtering of Cielings and Walls within Doors; and that made of hard Stones, for Buildings, and for plaiſtering without Doors.

Before the Stones be thrown into the Kiln, they are to be broke in Pieces, otherwiſe the Air contain'd in their Cavities, too much expanded by the Heat, makes them fly with ſo much Violence, as to damage the Kiln. According to *Alberti*, and *Palladio*, *Lime* will not be ſufficiently burnt in leſs than ſixty Hours intenſe Heat. The Marks of a well-burnt *Lime*, according to *Alberti*, is, that its Weight be to that of the Stone, in a ſeſquialterate Proportion; that it be white, light, and ſonorous; that when ſlacken it ſticks to the Sides of the Veſſel: To which *Boekler* adds, that when ſlacken it ſends forth a copious thick Smoak; and *Dieuſſant*, that it needs a great deal of Water to ſlack it; but it muſt not be wetted all at once, but only by ſlow Degrees, to prevent its burning before it be duly temper'd. When ſlack'd, it may be kept ſeveral Years, by letting it paſs through a Hole open at the Bottom of the Veſſel, into a Pit dug under Ground, and as ſoon as it is full, covering it with Sand, to prevent its drying. *Boekler* gives another Method. He will have a *Stratum* of *Lime* cover'd, two or three Foot high, with another of Sand of the like Height, and then Water enough pour'd on to ſlack the *Lime*, but not to reduce it to Duſt after ſlacking. If the Sand cleave into Chinks, as the Smoak aſcends, they muſt be cover'd up, ſo as no Vent may be given thereto. This *Lime*, he adds, kept ten or twelve Years, will be like Glue, and will, further, be of particular Uſe in painting Walls, as being no ways prejudicial to the Colours.

But we muſt likewiſe have our Proviſion of SAND, which is a fine, hard, gravelly Sort of Earth, or rather Stones divided into ſmall Grains; of great Uſe in *Building*.

There are three Sorts of *Sand* proper to be employ'd in *Building*, *viz.* Pit-Sand, River-Sand, and Sea-Sand. The firſt is the beſt, and is either of a black, white, red, or aſh Colour; which laſt is a ſort of Earth burnt by Fire incloſed in the Cavities of Mountains. Among the various Kinds of Pit-Sand, the white is found by Experience to be the worſt; and of River-Sand, the beſt is that which is found in rapid Streams, and under Water-falls; becauſe it is moſt purg'd. Sea-Sand is the worſt; but if us'd, it muſt be that which is of a blackiſh Colour, and ſhines like Glaſs; but that whoſe Particles are biggeſt, and lies neareſt the Shore, is better than any other Sort.

Pit-Sand, as it is of a fatter Subſtance than the reſt, makes a more tenacious Cement; and though it is apt to crack, is frequently made Uſe of in *building* long Vaults, or raiſing Walls. *River-Sand* is proper enough for rough-caſting of Walls. *Sea-Sand* being ſoon wet, and ſoon dry, and of a ſaline Quality, which ſoon melts away, is very improper to ſuſtain any conſiderable Weight.

That *Sand* is good in its Kind, which, when ſqueezed and handled, crackles; and if being put on a white Cloth, neither ſtains, nor makes it foul. That *Sand* is naught, which, mix'd with Water, makes it dirty and muddy, and which has been long in the Air; for ſuch will retain much Earth, and rotten Humour. Hence ſome Maſons waſh their *Sand*, e're they uſe it.

De Lorme obſerves, after *Vitruvius*, that the *Sand* of the *Terra de Lavoro*, in the Territories of *Baia* and *Cuma*, call'd by *Vitruvius Pozollana*, is the beſt in the World, eſpecially for maritime *Buildings*; for being thrown into Water, it cements immediately, and makes excellent Mortar.

Our TIMBER, which is one of the principal, and of the moſt expenſive Articles, muſt conſiſt, 1. Of *Oak*, for Poſts, Rails, Boards, *&c.* 2. *Elm*, for Dreſſers, *&c.* 3. *Beech*, which can ſupply the Want of *Oak*. 4. *Aſh*, which is of a general Uſe in *Building*, eſpecially where it may lie dry. 5. *Fir*, commonly known by the Name of *Deal*; for Floors, Stairs, Wainſcot, and moſt Works of Ornament. 6. *Walnut-tree*, is us'd within Doors, being of a more curious brown Colour than *Beach*, and leſs ſubject to the Worms. 7. *Service tree*, as yielding Beams of a conſiderable Bigneſs. 8. *Cheſnut-tree*, which is the moſt laſting, next to *Oak*. And, 9. *Alder*, much uſed for Sewers, and Pipes to convey Water: When always wet, it grows hard like a Stone; but where ſometimes wet, and ſometimes dry, it rots preſently.

The Opinions and Practices of Authors are very different, as to the beſt Seaſons for felling *Timber*. *Vitruvius* tells us, in the ninth Chapter of his ſecond Book, that *Timber* ought to be fell'd in Autumn, and during all the Winter Seaſon; for then the Trees have a Strength and Vigour convey'd to them from the Roots, which in Spring and Summer was diſpers'd among the Leaves and Fruits. In Effect, though *Timber* unbark'd be moſt obnoxious to Worms, yet we find the *Wild Oak*, and many other Kinds, if fell'd too late, when the Sap begins to be proud, to be very ſubject to Worms; whereas about Mid-winter it neither caſts, rifts, nor twines. The ſame Author will alſo have *Timber* fell'd in the Moon's Decreaſe; for then, ſays he, a certain Moiſture, which is very apt to engender Worms, and rot *Timber*, is ſpent, and dry'd up.

Palladio's Sentiment is, that *Timber* ought, at firſt, to be cut no further than the Pith, when it muſt be left till it be perfectly dry; for then the Moiſture will all ſweat away, which engenders Putrefaction.

Pliny orders it to be fell'd in the very Article of the Change of the Moon, which happening on the laſt Day of the Winter Solſtice, the *Timber*, ſays he, will be immortal. *Columella* ſays, from the 20th to the 28th Day. *Cæto*, four Days after the Full. *Vegetius*, from the 15th to the 25th, for *Ship Timber*.

Some even have Regard to the Temper, and Time of the Day; the Wind to be low, neither Eaſt nor Weſt, neither in froſty, wet, nor dewy Weather; and therefore never in the Forenoon.

When *Timber* is cut down, *Palladio* will have it ſtor'd up in ſome Place where it may not be expos'd to the Heat of the Sun, or to the Injuries of the Weather; particularly ſuch Trees as riſe out of the Ground without being planted; and be daub'd over with Cow-Dung, to prevent its ſplitting. It is not to ſtand upright, but to lie all along, one Piece over another, only kept apart by ſhort Blocks interpos'd, to prevent a certain Mouldineſs which they are apt to contract in ſweating on one another; from which frequently ariſes a ſort of Fungus, eſpecially if there be any ſappy Parts remaining. Others adviſe Boards, Planks, *&c.* to be laid in ſome Pool, or running Stream, for a few Days, to extract the Sap from them, and afterwards to dry them in the Sun or Air. By this Means, it is ſaid, they will be prevented from either chapping, caſting, or cleaving; but againſt ſhrinking there is no Remedy. Mr. *Evelyn* particularly recommends this Method for *Fir*. Others, again, are for burying them in the Earth, others in Wet, and others for ſcorching and ſeaſoning them in Fire; eſpecially Piles, Poſts, *&c.* that are to ſtand either in Water, or Earth. Sir *Hugh Plat* informs us, that the *Venetians* burn and ſcorch their *Timber* in the flaming Fire, continually turning it round with an Engine, till it has got a hard, black, cruſty Coal upon it.

Timber muſt never be drawn in the Morning, whilſt the Dew falls, but in the Afternoon; neither muſt it be work'd if it is very wet, or very dry; for in one Caſe it will be liable to rot, and in the other will make but very awkward Work: Neither will it be dry enough to be work'd into Planks, Doors, and Windows, in leſs than three Years. But as all Architects do not, or cannot take this laſt Precaution, and conſequently *Timber* is but too often liable to Chops or Clefts, by its having been work'd too green, which is a very great Eye-ſore in many fine Buildings; thoſe Chops or Clefts are clos'd by anointing, ſuppling, and ſoaking

ſoaking it with the Fat of powder'd Beef-Broth, twice or thrice repeated. Some Carpenters uſe Greaſe and Saw-duſt mingled, for the ſame Purpoſe; but the former Method is excellent, only it is not to be us'd while the *Timber* is green.

We muſt alſo provide our ſelves with IRON, for Cramps, Nails, Hinges, Bolts, Gates, Bars, and ſuch like Work.

One diſtinguiſhing Mark of the Goodneſs of *Iron* is, when its Veins are found to run ſtrait, and unbroken, after it is work'd into Bars, and when the two Extremes of the Bar are clean, and without Foulneſs; for theſe Veins are an Indication that the *Iron* is free from Knots and Flaws; and by the Extremes we may judge of the Goodneſs of the Middle. If its Sides are found to be ſtrait after it is wrought into Plates, or into any other Form whatever, we may pronounce it equally good in all its Parts, as it has endur'd the Hammer in equal Proportion.

We may cover our Building either with LEAD, (which is alſo us'd for Pipes and Gutters to convey Water, and in faſtening all Sorts of Iron-work in Stone) or with *Copper*, *Slate*, or *Tyles*.

There are three Kinds of *Lead*, *viz.* white, black, and of a Colour between both, commonly call'd Aſh Colour. The white and aſh-colour'd *Leads* are more perfect and valuable than the black, though not really black, but only has a few black Spots in it. *Lead*, for our Uſe, is either caſt into Sheets in a Mould, or mill'd; which laſt, ſome have pretended, is leaſt ſerviceable, not only on account of its Thinneſs, but alſo becauſe it is ſo exceedingly ſtretch'd in milling, that when it comes to lie in the hot Sun, it is apt to ſhrink and crack, and conſequently will not keep out the Water: But this appears to be a Suggeſtion, without Ground.

COPPER is at preſent but ſeldom employ'd in covering any Kind of Edifices, not even publick ones; as being too expenſive, and too heavy, except in *Sweden*, where it is very common. The Antients us'd to make a kind of Cramps, or Hooks, with it, which being fix'd in the Stones, bind them faſt, ſo that they never looſen: By means of theſe Cramps, a Building, which muſt neceſſarily conſiſt of a great Number of Stones, is ſo join'd and fix'd together, that it appears to be but one entire Piece; and therefore is much ſtronger, and more laſting. Theſe Cramps, or Hooks, are now made of Iron; but the Antients choſe rather to make them, for the moſt Part, of *Copper*; becauſe as that Metal is not apt to ruſt, it is therefore more durable. This Metal, likewiſe, was uſed in making Letters for Inſcriptions that were plac'd in the Friezes of Buildings; and Hiſtorians aſſure us, that the hundred Gates of *Babylon*, ſo much taken Notice of, were all of *Copper*; as alſo the two Pillars of *Hercules*, which were eight Cubits high, in the Iſland of *Gades*.

The beſt *Copper* is that, which, when drawn out of the Mine, and purify'd by Fire, is of a reddiſh Colour, but ſomewhat inclining to a yellow, and full of Pores. It may be heated like Iron, and liquify'd, and therefore capable of being caſt; and though hard, may be render'd ſo ſoft and pliant, as to be wrought into very thin Leaves. When mix'd with Tin, Lead, or Latten, which laſt is another Sort of *Copper*, but colour'd with *Lapis Calaminaris*, it makes a Metal call'd *Braſs*, which is often made Uſe of by *Architects* in making of Baſes, Columns, Capitals, Statues, and ſuch like Decorations.

SLATE is a blue fiſſil Stone, very ſoft when dug out of the Quarry, and on that Account eaſily cut, or ſaw'd into thin long Squares, or Eſcallops, to ſerve in lieu of Tiles for the covering of Houſes; ſometimes, alſo, to make Tables of, and cover withal.

The *blue Slate* is a very light, laſting, and beautiful Covering, but chargeable withal, in regard the Roof muſt be leated over with thin Laths, of about two Inches broad, and two Foot and a Half long, plac'd cloſe to one another, and each *Slate* requiring a Peg, and a Nail, at leaſt; though in ſome Countries *Slaters*, or Coverers, put the Nails in their Pockets, if not narrowly watch'd by the Architect, and content themſelves with a Couple of Pegs, ſometimes with but one; from which they reap a double Advantage, firſt, in pocketing the Nails; and, ſecondly, being in Hope of being wanted ſoon to repair the Damages which the Slightneſs of their Work will occaſion. I do not ſpeak in this Place by way of Prevention, ſince before I had qualify'd my ſelf for an Author, I have been often put to thoſe unneceſſary Charges. For in *Britanny* to uſe Mortar in *Slater*'s Covering, is alſo a Cheat of the Coverers; beſides, it is impoſſible the Covering ſhould be ſo neat, and ſo agreeable to the Eye, with Mortar, let it be ever ſo thin, as without. We have no other Covering, eſpecially in what's call'd *Baſſe Bretaigne*, or *Low Britanny*, than that of *blue Slates*, which are very common in that Country, and ſeldom ſold dearer than fifty Sols, or three Livres a thouſand.

Here in *England* beſides blue, we have likewiſe grey Slates, called *Horſham-Stones*, from a Town, in *Suſſex*, of that Name, where the greateſt Quantities of it are found; and which is chiefly uſed in the Covering of Churches, Chapels, Chancels, *&c.*

The Timber of the *Roof* need be very ſtrong for theſe grey *Slates*, it being almoſt double the Weight of Tiles.

Mr. *Colepreſs* informs us, in the *Philoſophical Tranſactions*, that to judge of the Goodneſs of *Slate*, it muſt be knock'd againſt any hard Body, to make it yield a Sound; for if the Sound be good and clear, the *Slate* is firm and good, otherwiſe 'tis crazy. Moſt of the Coverers in *Slates* know that, without having Recourſe to the *Philoſophical Tranſactions*; for when they perforate the *Slate*, in order to place the Nails and Pegs, no crazy *Slate* will undergo the Operation, without breaking. *Slates* which are ſcaly, like Fiſhes, are not good. Theſe two Methods are the ſureſt to diſcover the Goodneſs of *Slate*, and all others propos'd by our Naturaliſts are too tedious, and very uncertain, eſpecially that of weighing it, and letting it lie afterwards ſix or eight Hours under Water, under Pretence that if after it has been wip'd clean it weighs more than it did before, it is of that Kind that ſoaks in Water, and therefore will not long endure without rotting the Lath or Timber; ſince in a Thouſand *Slates* there are, perhaps, three or four different Sorts, though taken from the ſame Quarry. Another Method propos'd for the Trial of *Slates*, is by placing one Half a Day in a Veſſel of Water, ſo as to reach a conſiderable Height above the Level thereof; if the *Slate* be firm and cloſe, then it will not draw Water, that is, the Water will not have aſcended above Half an Inch above the Level of that in the Veſſel, nor that, perhaps, any where but at the Edges, the Texture whereof might be looſen'd by hewing; but a bad Stone will draw the Water to the very Top, be it as high as it will. Which Method is alſo very precarious, unleſs it was poſſible to make the Experiment on every individual Stone; and who would take that Trouble? Beſides, I know, by Experience, that very few *Slates*, let them be ever ſo good, will draw the Water, unleſs they be wetted before; for then, by the Analogy between the aqueous Particles the *Slate* is impregnated with, and thoſe in the Veſſel, agitated by the ambient Atmoſphere, the *Phænomenon* will happen on bad *Slates*, as well as good ones.

Our moſt common Covering in *England* is made of TYLES, which are a Sort of thin, fictitious, laminated Stones; or, more properly, a fat clayey Earth, knodden and moulded of a juſt Thickneſs, dry'd, and burnt in a Kiln, like a Brick.

All Sorts of *Tyles* are not employ'd in Covering, nor proper for it, but only thoſe call'd *plain*, or *thack Tyles*, ſqueez'd flat, while yet ſoft, in a Mould, of an *oblong* Figure, and which, by Stat. 17 *Ed.* 4. *c.* 4. are to be 10½ Inches long, 6¼ broad, and Half an Inch and Half a Quarter thick.

Among theſe may be rank'd, 1. *Ridge*, *Roof*, or *Creaſe-Tyles*, made circular, breadth-wiſe, like a half Cy-

Cylinder, and us'd to cover the Ridges of *Houſes*; by the *Statute* they are to be 13 Inches long, and of the ſame Thickneſs with the *plain Tyles*. 2. *Hip*, or *Corner Tyles*, which lie on the Hips or Corners of *Roofs*. They are flat, like *plain Tyles*, but of a quadrangular Figure, whoſe two Sides are right Lines, and two Ends Arches of Circles; one End being a little concave, and the other convex; the convex End to be about ſeven Times as broad as the concave; ſo that they would be triangular, but that one Corner is taken off: Then, before they are burnt, they are bent on a Mould breadth-wiſe, like *Ridge-Tyles*. They have a Hole at their narrow End, to nail them on by; and are laid with their narrow End upward. By the *Statute* they are to be 10½ Inches long, and of a convenient Breadth and Thickneſs. 3. *Gutter Tyles*, which lie in Gutters, or Valleys, in croſs Buildings. They are made like *Corner-Tyles*, only the Corner of the broad End are turn'd back again with two Wings. They have no Holes in them, but are laid with the broad End upwards, without any Nailing. They are made in the ſame Mould as *Corner-Tyles*, and have the ſame Dimenſions of the convex Side. Their Wings are each four Inches broad, and eight Inches long. 4. *Pan*, *Crooked*, or *Flemiſh-Tyles*, us'd in covering of Sheds, Lean-to's, and all Kinds of *flat-roof'd* Buildings; they are, like *Plain-Tyles*, in the Form of an *oblong Parallelogram*, but are bent breadth-wiſe, forwards and backwards, in Form of an S, only one of the Arches is at leaſt three Times as big as the other; which biggeſt Arch is always laid uppermoſt, and the leſſer Arch of another *Tyle* lies over the Edge of the great Arch of the former. They have no *Holes* for Pins, but hang on the Laths by a Knot of their own Earth; they are uſually 14½ Inches long, and 10½ broad. By 12 *G.* 1. *c.* 25. they are to be, when burnt, no leſs than 13½ Inches long, 9½ wide, and ⅛ an Inch thick. 5. *Dormar*, or *Dorman-Tyles*, which conſiſt of a *Plain Tyle*, and a triangular Piece of a *Plain Tyle*, and ſwept with an Arch of a Circle from the other End, which End terminates in a Point. Of theſe *Tyles* there are two Kinds, the triangular Piece, in ſome, ſtanding on the right, in others on the left Side of the *Plain Tyle*; and of each of theſe, again, there are two Kinds, ſome having a whole *Plain Tyle*, others but Half a *Plain Tyle*: But in them all the *Plain Tyle* has two *Holes* for the Pin, at the End where the broad End of the triangular Piece ſtands. Their Uſe is to be laid in the Gutters, betwixt the *Roof* and Cheeks, or Sides of the *Dormars*, the plain Part lying on the *Roof*, and the triangular Part ſtanding perpendicularly by the Cheek of the *Dormar*. They are excellent to keep out the Wet in thoſe Places, and yet are not known, perhaps, any where, but in *Suſſex*. The Dimenſions of the *Plain Tyle*'s Parts, are the ſame as thoſe of a *Plain Tyle*; and the triangular Part is of the ſame Length, and its Breadth at one End 7 Inches, and at the other nothing. 6. *Scallop*, or *Aſtragal-Tyles*, which are in all Reſpects like *Plain-Tyles*, only their lower Ends are in Form of an *Aſtragal*, *viz.* a Semicircle, with a Square on each Side. They are us'd in ſome Places for *Weather-Tyling*. And, 7. *Traverſe-Tyles*, a kind of irregular *Plain-Tyles*, having the *Pin-holes* broke out, or one of the *lower Corners* broke off. Theſe are laid with the *broken End* upwards, upon Rafters, where pinn'd *Tyles* cannot hang.

All theſe Kinds of *Tyles* are laid either dry, as they come from the Kiln, without *Mortar*, or any Thing elſe; or in a kind of *Mortar* made of *Loam* and *Horſe-Dung*. In ſome Parts of *Kent* they lay them in *Moſs*.

According to *Stat.* 17 *Ed.* 4. the Earth for *Tyles* ſhould be caſt up before the firſt of *November*, ſhired, and turned, before the firſt of *February*; and not made into *Tyles* before the firſt of *March*; and ſhould likewiſe be try'd, and ſever'd from Stones, Marle, and Chalk.

We muſt alſo provide our ſelves with *Flemiſh*, or *Dutch Tyles*, for Jambs of Chimneys, inſtead of Chimney Corner-Stones; for they divert agreeably the Sight by the Variety of the Figures painted on them. The antient *Dutch Tyles*, which are not ſo beautiful as the modern ones, are ſeven Inches and a Quarter ſquare, and about three Quarters of an Inch thick; the modern are ſix Inches and a Half ſquare, and three Quarters of an Inch thick.

Having thus provided our ſelves with all the Materials neceſſary for *building*, we muſt, in the next Place, make Choice of the beſt Artiſts, in order that the *Work* may be well purſu'd under their Direction; and who ſhould have under them *Workmen* not only entire Maſters of their Art, or Profeſſion, but likewiſe truly *honeſt*, and who ſhould make a Point of *Conſcience* to be paid without *working*; not thoſe *Thieves*, and *lazy Fellows*, who don't care how little they *work*, provided they be ſure to be well paid at the latter End of the *Week*; who are an *Hour* in moving, or placing a Stone, which a Child would do in Half the Time; who are three or four in carrying, or lifting up one, of perhaps thirty or fifty Pounds Weight, and then reſt themſelves, by Intervals, as if they were overburthen'd; who ſaw another with the ſame Heavineſs and Indolence as if they had taken a Doſe of Opium, or were reſolv'd to communicate ſome of their *narcotick Vapours* to the Paſſengers; and who ſeem'd to have enter'd, at that Time, into a Sort of *Convention* with all their Relations and Acquaintance, that they ſhould come to diſturb them from their *Work*. To remedy theſe Diſorders, we'll have under us ſome Perſons of *Probity*, to watch narrowly the *Conduct* of ſuch *Robbers*, and to have thoſe diſmiſs'd who ſhall be found guilty.

Thoſe Artiſts are to be *Maſons*, *Stone-cutters*, *Carpenters*, *Joiners*, *Plumbers*, *Plaiſterers*, *Glaſiers*, &c.

My mentioning *Glaſiers*, puts me in Mind, that I had *forgot* to *provide* my ſelf with *Glaſs* for the *Windows*; of which there are *various Sorts*. 1. *Crown Glaſs*; of which, ſays *Neve*, there are two Kinds, diſtinguiſh'd by the Places where they are *work'd*, *viz.* *Ratcliff Crown Glaſs*, which is the beſt, and cleareſt, and was firſt made at the *Bear-Garden* on the *Bank-Side*, *Southwark*; but ſince at *Ratcliff*: Of this there are twenty-four Tables to the Caſe, the Tables being of a circular *Form*, about three Foot ſix Inches in Diameter. *Lambeth Crown Glaſs*, which is of a darker *Colour* than the former, and more inclining to green.

2. *Newcaſtle Glaſs*, which is that moſt us'd in *England*, is of an Aſh *Colour*, and ſubject to Specks, Streaks, and other Blemiſhes; and, beſides, is frequently warp'd. *Leybourn* ſays, there are forty-five Tables to the Caſe, each containing five ſuperficial Feet; ſome ſay, there are but thirty-five Tables, and ſix Foot in each Table.

At preſent, we'll put on our *leather Apron*, and go to *work*; beginning with making our *Mortar*, ſince we have already ſlacken our *Lime*; but we muſt ſay, firſt, that MORTAR, or *Morter*, is a *Compoſition* of *Lime*, *Sand*, &c. mix'd up with Water, ſerving as a Cement to bind the Stones, *&c.* of a *Building*.

De Lorme obſerves, that the beſt *Mortar* is that made of *Pazzalana*, for Sand; adding, that it penetrates black Flints, and turns them white. Mr. *Worledge* is of Opinion, that the rounder Sand makes the ſtrongeſt *Mortar*; and that fine Sand makes it weak: He therefore adviſes, to have the Sand waſh'd, e're mix'd; and adds, that dirty Water weakens the *Mortar* conſiderably. *Wolfius* will have the Sand dry and ſharp, ſo as to prick the Hands, when rubb'd; yet not earthy, ſo as to foul the Water it is waſh'd in. *Palladio* takes Notice, that of all Sands, white ones are the worſt; that if we make our *Mortar* with Pit Sand, we muſt take three Parts of it, and mix it with one of Lime; but if we make Uſe of River, or Sea Sand, our Proportion muſt be two Parts of Sand only, and one of Lime. About *London*, the Proportion of Sand to Quick Lime is as 36 to 25; in ſome Parts they uſe an equal Quantity of each.

M. *Felibien* obſerves, that the antient *Maſons* were ſo very

very ſcrupulous in mixing and blending of *Mortar*, that the *Greeks* kept ten Men *conſtantly employ'd*, for a long Space of Time, to each *Baſon*, which render'd the *Mortar* of ſuch a *prodigious Hardneſs*, that *Vitruvius* tells us the Pieces of Plaiſter falling off from old Walls, ſerv'd to make Tables. *Felibien* adds, it is a Maxim among old *Maſons* to their Labourers, that they ſhould dilute with the Sweat of their *Brow*, *i. e.* labour it a long Time, inſtead of drowning it with Water, to have done the *ſooner*.

There are two other Sorts of *Mortar* employ'd in *Building*, *viz. white Mortar*, made of Ox-hairs, mix'd with Lime and Water, without any Sand, us'd in plaiſtering the Walls and Cielings; and a hard *Mortar* made of Lime and Hog's Greaſe, ſometimes mix'd with the Juice of Figs, and ſometimes with liquid Pitch, employ'd in making of Water-Courſes, Ciſterns, *&c.* This, after Application, is waſh'd over with Linſeed Oil.

While our Labourers are employ'd in making the firſt Kind of *Mortar*, which is that we want firſt, we'll examine the Qualities of the Ground on which the *Foundation* of our Edifice is to be laid: But we muſt know, firſt, that FOUNDATION, in this Caſe, is that Part of a Building which is *under Ground*, and ſuſtains the whole Edifice; or upon which the Walls of the Superſtructure are rais'd.

Palladio obſerves, that of all the *Errors* in *Building*, thoſe are the moſt fatal that are committed in the *Foundation*; becauſe they at once endanger the whole Structure: Nor can it be rectify'd, but with the utmoſt Difficulty. That therefore the *Architect* muſt take great Care to make Choice of a *good Foundation*.

That we may *found* our *Habitation* firmly, ſays Sir *H. Wotton*, we muſt firſt examine the Bed of Earth upon which we are to build.

The *Foundations* of *Buildings* are either *natural*, or *artificial*. A *natural Foundation* is when the *Soil* is *rocky*, or conſiſts of a ſoft ſandy *Stone*, or *Gravel*, which is a Sort of Earth inclining to be *rocky*; for without digging, or any other Aſſiſtance from Art, theſe *Foundations* are ſtrong of themſelves, and capable of ſuſtaining the moſt cumbrous Structure, either on Land or Water. *Artificial Foundation*, is where the *Ground* is ſandy, or marſhy, or have lately been dug.

But how ſhall we be able to make the Difference between a *ſolid* and *rocky*, and a *ſandy* or *marſhy* Earth? *Palladio* informs us, that ſuch Difference can eaſily be made, and the *Solidity* of the *Ground* known, by the following *Indications*. 1. By digging of Wells, Ciſterns, and the like. 2. By the Herbs that grow upon it, if they are ſuch as ſpring up only in a firm and *ſolid Soil*. 3. If when any Thing *ponderous* is thrown upon it, it neither ſhakes, nor reſounds, which may alſo eaſily be obſerv'd by the Aſſiſtance of a Drum, if when 'tis ſet upon the *Ground*, and gently touch'd, it does not *reſound*, nor *ſhake* the Water in a Veſſel that ſtands hard by. 4. By the *Solidity* of the Earth in the Places adjacent.

If the Earth be *ſolid*, the *Architect* muſt adjuſt the Depth of the *Foundation* by the Height, Weight, *&c.* of the *Building*; a ſixth Part of the whole Height, where there are to be no Cellars, nor other Offices, *under Ground*, is look'd on as a Medium; and as to Thickneſs, double that of the Width of the Wall, is a good Rate.

But if it be a *gravelly*, or *ſandy Spot*, not to be truſted, particular Care is to be taken, whether it be on Land, or in the Water; for if it be on Land, the *Obſervation* of what has been already mention'd, concerning *firm Ground*, will be ſufficient; if we build in the Water, the Sand and Gravel will be of no manner of Service; for the Water, by reaſon of its continual Current and Flood, is ever varying its Bed. We muſt therefore dig till we find a *ſolid Bottom*; or, if this can't be effected with Eaſe, we muſt then dig a little into the Sand and Gravel, and driving in Piles of Oak, till the Ends reach the *good Ground*, and on theſe we may build. This Operation is call'd *Paliſſication*. But if we are oblig'd to build upon *moſſy* and *looſe Earth*, we muſt then dig till we find *ſound Ground*, and that in *Proportion* to the Thickneſs of the Walls, and the Bulk of the Structure.

This *firm* and *ſolid Ground*, fit to *ſupport* a *Building*, is of various Kinds: For, as *Alberti* juſtly obſerves, in ſome Places it is ſo hard, that Iron can ſcarcely penetrate it, and ſometimes harder than Iron it ſelf. In ſome Places it is of a blackiſh, and in others of a whitiſh Caſt, which is deem'd the weakeſt. In ſome it is like Chalk, and in others ſoft and ſandy.

Of theſe various Kinds, that is the beſt which is cut with moſt Difficulty; or, when wet, does not diſſolve away in Mud and Dirt. An *old Foundation* muſt never be built upon before we know its Depth, and are well aſſur'd that it is able to ſuſtain the Fabrick.

But if the Earth, we *build* upon, be very *ſoft*, as in *marſhy Ground*, we muſt ſtrengthen it with Piles, whoſe Length muſt be the eighth Part of the Height of the Walls, and their Diameter the twelfth Part of their Length. Theſe Piles muſt be drove in ſo *contiguous* to one another, that no others can be ſet between them; and particular Care muſt be taken to ram them in, with gentle Blows often repeated, rather than with Violence; for the Earth will *conſolidate* better the one Way, than the other. Piles muſt be drove, not only under the Walls, but alſo under the inner, or Partition-walls; for if the *Foundations* of the inner Walls are weaker than thoſe of the outer Walls, when we come to lay the Girders, and Joiſts, we'll find by Experience, that inward Walls will ſink, while thoſe on the Out-ſide will ſtand firm, becauſe they were rais'd on Piles; then all the Walls will crack, and deſtroy the whole Structure; beſides, theſe Creviſſes ſtrike the Eye very diſagreeably. As, therefore, the Expence for Piles will be of leſs Importance than the endangering of the whole Fabrick, we muſt not be too ſaving, but diſtribute them according to the *Proportion* of the Walls, and take Care that thoſe within are plac'd ſomewhat thinner than thoſe on the Out-ſide of the *Building*.

In ſome Places they *found* the Peers of Bridges, and other *Buildings* near the Water, on Sacks of *Wool*, laid like Matraſſes; which, being well preſs'd, and greaſy, will never give way, nor *rot* in Water.

The *Foundation* is properly ſo much of the *Maſonry* as reaches as high as the Surface of the *Ground*. Sometimes it is maſſive, and continu'd under the whole *Building*; as in the antique Arches, and Aquæducts, and ſome Amphitheatres: More uſually it is only in Spaces, or Intervals, either to avoid Expence, or becauſe the Vacuities are at too great a Diſtance; in which latter Caſe they make Uſe of inſulated Pillars, bound together by Arches.

For our Part, we ſuppoſe to have found a *rocky* and *ſolid Foundation*, very well ſituated, for the Salubrity of the Air, the Conveniency of Water, Fuel, Carriage, *&c.* and the Agreeableneſs of the Proſpect; which are all Circumſtances to be conſider'd, as near as poſſible, for the Erection of a compleat Edifice.

Having thus fix'd on the *Ground-Plot* for our *Building*, and ſuppoſing that we have *Room* enough to make it anſwer all the Purpoſes above-mention'd, we'll make *Draughts* of the *Ichnography*, or *Ground-Plot* of each *Floor*, or *Story*; which *Ichnography* is a tranſverſe Section of a *Building*, exhibiting the Circumference of the whole Edifice, and of the ſeveral Rooms and Apartments in the given Story, together with the Thickneſs of the Walls and Partitions, the Dimenſions of the Doors, Windows, and Chimneys; the Projectures of the Columns, and Peers, with every Thing viſible in ſuch Section. Therefore on this Draught of the *Ichnography* depends the *Form* or *Diſpoſition* of our *Building*, which muſt be either *ſimple* or *mix'd*.

The *ſimple Forms* are either *circular*, or *angular*; and the *circular* ones either *compleat*, as *juſt Spheres*; or *deficient*, as *Ovals*.

The *circular Form* is very commodious, of the greateſt Capacity of any; ſtrong, durable beyond the reſt, and very beautiful: But then it is found of all others the moſt chargeable; much *Room* is loſt in the bending of the Walls, when it comes to be divided; beſides an ill Diſtribution of Light, except from the Center of the Roof. It was on this Conſideration that the Antients only us'd the *circular Form* in Temples and Amphitheatres, which needed no Compartition. *Oval Forms* have the ſame Inconveniencies, without the ſame Conveniencies, being of leſs Capacity.

For *angular Figures*, Sir *Henry Wotton* obſerves, that *Buildings* neither love many, nor few *Angles*: The *Triangle*, *v. gr.* is condemn'd above all others, as wanting Capacity and Firmneſs; as alſo becauſe irreſolvable into any other regular Figure, in the inward Partitions, beſides its own. For Figures of five, ſix, ſeven, or more *Angles*, they are fitter for *Fortifications* than *Civil Buildings*. There is, indeed, a celebrated *Building* of *Vignola*, at *Caprarola*, in Form of a Pentagon; but the *Architect* had prodigious Difficulties to grapple with, in diſpoſing the Lights, and ſaving the Vacuities. Such *Building*, then, ſeems rather for Curioſity, than Conveniency, and for this Reaſon Rectangles are pitch'd on, as being a Medium between the two Extremes. But, again, whether the Rectangle is to be juſt a Square, or an Oblong, is diſputed. Sir *Henry Wotton* prefers the latter, provided the Length do not exceed the Breadth by above one Third. Mix'd Figures, partly circular, and partly angular, may be judg'd of from the Rules of the ſimple ones; only they have this particular Defect, that they offend againſt Uniformity. Indeed, Uniformity, and Variety, may ſeem to be oppoſite to each other; but Sir *Henry Wotton* obſerves, they may be reconcil'd; and for an Inſtance mentions the Structure of the human Body, where both meet.

Having thus taken a curſory View of the ſeveral Forms and Diſpoſitions of a *Building*, as Money is always very flush with us Authors, and that five hundred or a thouſand Pounds more, or leſs, can't much impair our Finances, eſpecially when 'tis employ'd to build for our ſelves a commodious and beautiful Manſion, which we ſeldom meet with; this we are going to erect is to be of a *circular Form*, according to the *Ichnography*. Therefore we'll begin to work at the *Foundation*, which muſt be as thick again as the Wall intended to be rais'd upon it. The Plan of the Trench muſt be exactly level, that the Weight may preſs equally in all Parts, and not lean more to one Side, than the other, which occaſions the cracking and dividing of the Walls. The Antients, therefore, us'd to pave the Plan with Tivertine. The *Foundations* muſt always ſlope, that is to ſay, they muſt diminiſh in Proportion as they riſe, yet ſo as that there may be as much left on one Side as on the other, and ſo as the middle Wall above may be directly perpendicular over the Middle of that below; which muſt be alſo particularly regarded in the diminiſhing of Walls above Ground; for this will make the Fabrick much ſtronger than if the Diminutions were made any other Way.

Some will have the Materials, or Stones, laid in the *Foundation*, juſt as they grew in the Quarry, as ſuppoſing them to have the greateſt Strength in their natural Poſture. *De Lorme* obſerves, that the breaking, or yielding of a Stone in this Part, but the Breadth of the Back of a Knife, will make a Cleft of above Half a Foot in the Fabrick above. *Palladio* is of Opinion, that in large *Buildings* it is very proper to make Vents, or Holes, through the Body of the Walls, from the very *Foundations* to the *Roof*, in order to let out the Winds and Vapours, which are very prejudicial to the Fabrick, diminiſh the Expence, and will likewiſe be found extremely convenient in caſe winding Stairs are to be made from the Bottom to the Top.

The Foundations being thus laid, we are now to work towards the Erection of our Walls. The Antients made ſix Kinds of Walls. The firſt were called *Reticolata*, or *Net-Work*; the ſecond were compoſed of Quadrels, or Bricks; the third of Cement, conſiſting of Cement or Pebbles; the fourth of irregular and various Stones, and called *Ruſtick*; the fifth of Free-Stone; and the ſixth of *Riemputa*, or Coffer-work. They generally made the Angles, or Corners, of the Building of Bricks, and laid between every two Foot and a half, three Courſes of Bricks, which ſerve as a Kind of Band to the whole Work.

The Moderns diſtinguiſh *Walls* into *Plaiſter'd* or *Mud-Walls*, *Brick Walls*, *Stone-Walls*, *Flints*, or *Boulder-Walls*, and *Boarder-Walls*.

Mud and *Plaiſtered-Walls* are chiefly in ordinary Timber *Buildings*. Theſe *Walls*, being quartered and lathed between the Timber, or ſometimes lathed over all, are plaiſtered with Lome, which being almoſt dry, is plaiſtered over-again with white Mortar.

Brick Walls are the moſt important and uſual among us. In theſe, particular Care is to be taken about the Laying of the Bricks, *viz.* That in Summer they be laid as wet, and in Winter as dry as poſſible, to make them bind the better with Mortar: That in Summer, as faſt as they are laid they be covered up, to prevent the Mortar, *&c.* from drying too faſt: That in Winter they be covered well, to protect them from Rain, Snow, and Froſt, which are all Enemies to the Mortar: That they be laid Joint on Joint, in the Middle of the Walls, as ſeldom as may be, but good Bond made there, as well as on the Out Sides. Care is alſo to be taken that the Angles be firmly bound: In order to which, in working up the Angles of a Building, it is not adviſable to raiſe any *Wall* above three Feet high, ere the next adjoining *Wall* be wrought up to it. That good Binding may be made in the Progreſs of the Work.

Palladio's Sentiment is, that *Brick-Walls*, intended for any great Building, ought to be faced on both Sides, with Brick, and the Middle filled with Cement, rammed cloſe together with Brickbats; and that to every three Feet in Height, there ought to be three Courſes of *Bricks* of a larger Size than the others to bend the whole Breadth of the Wall. That the firſt Courſe ſhould be laid, ſo that the leſſer Side of the *Brick* may be outward; the ſecond Lengthways, that is to ſay, with its larger Side on the Outſide, and the third as the firſt.

Flint, or *Boulder-Walls* are uſually raiſed by a Right and Left-handed Man, who has had a Hod of Mortar poured down on the Work, which they part betwixt them; each ſpreading it towards himſelf, and ſo they lay in the Flints. The Mortar for this Work is to be very ſtiff. Theſe *Walls* are uſed for Fence-Walls, a-round Courts, Gardens and Outhouſes.

The *Cement Walls* of the Antients were made ſo, as there ſhould be three Courſes of Bricks, and diſpoſed as above, to every two Foot at the leaſt. In erecting their *Ruſtick-Walls*, made of irregular Stones, they uſed a leaden Rule, which being bent, according to the Place, where the Stone was to be ſet, demonſtrated how it was to be ſquared; ſo that when it was once cut, they immediately fixed it in its Place. Their *Walls*, called *Coffer-Work*, were made by taking Planks laid Edge-way, according to the Thickneſs of the *Walls*, filling the Void with Cement, and all Sorts of Stones mingled together, and continued, after this Manner, from Courſe to Courſe.

Note, That *Courſe* denotes a continued Range of Stones, level, or of the ſame Height, throughout the whole Length of the *Building*, and not interrupted by any Aperture.

Walls as they advance, muſt diminiſh proportionably in their Thickneſs, and ſuch as appear above-ground muſt be half as thick as thoſe in the Foundations. Thoſe of the ſecond Story muſt be half a Brick thinner than thoſe of the firſt, and in like manner to the Top of the Fabrick: Due Care, however, muſt be taken, not to make the upper Part too weak. The Middle of the *Wall* above muſt be exactly perpendicular over the Middle of thoſe below; which will

will give the whole *Wall* a Pyramidical Form. Moreover, if we be forced to make the Superficies of the upper *Wall*, exactly over that beneath, it must be done inwardly; for the Floors, the Beams, the Vaults, and other Supports of the Edifice, will keep the *Walls* from falling inward. The set-off, or discharged Parts, on the Outside, must be covered with a *Fascia* and a Cornice, which surrounding the whole Fabrick, will bind as well as beautify it. As the Angles of an Edifice are common, to two Sides or Faces to keep them upright, and fast together, we must take Care to make them very strong and substantial, and to hold them with long and hard Stones, as it were with Arms. The Windows, therefore, and other Openings, ought to be as far distant from the Angles as possible; or, at least, so much Space ought to be left, as is the Breadth of the said Opening.

It is not entirely left to our Option in *England*, especially in *London*, to build our Houses in the Manner we please, particularly as to the Brick Work; for this is regulated, as well as the other Parts, Proportions, *&c.* by a Statute made for rebuilding the City after the Fire; by this it is enacted, that in all Houses of two Stories, besides Cellars and Garrets, and fronting bye Streets, and Lanes, the *Walls* in front and rear, as high as the first Story, shall be full the Thickness of the Length of two Bricks; and thence upwards to the Garret of the Thickness of one Brick and an half; and that the Thickness of the Garret *Walls*, on the back Part, be left to the Discretion of the Builder; so that the same be not less than one Brick in Length; and that the Thickness of the *Party-Wall*, in the Garret, be of the Thickness of the Length of one Brick, at least. That in Houses of three Stories high, besides Cellars and Garrets, the *Walls* in the front and rear, as high as the first Story, be two Bricks and a Half thick; and from thence upward, to the Garret Floor, of one Brick and an Half thick; and the Thickness of the Garret *Walls*, on the back Part, be left to the Discretion of the *Builder*, so that the same may not be less than one Brick thick; and also that the Thickness of the *Party-Walls*, between every House of this second and larger Sort of *Building*, be two Bricks thick, as high as the first Story, and thence upwards to the Garret of the Thickness of one Brick and an Half. That Houses of four Stories high, besides Cellars and Garrets; the *Walls* in front and rear as high as the first Story, be two Bricks and an Half in Thickness, and from thence upwards to the Garret Floor, of the Thickness of one Brick and an Half; and that the Thickness of the Garret *Walls*, on the back Part, be not less than one Brick: And also that the *Party-Walls* between every House of this third, and larger Sort of *Building*, be two Bricks thick, as high as the first Floor, and thence upwards to the Garret Floor, one Brick and an Half.

But in our present Undertaking, we are not under those narrow Regulations, since the conducting of Mansion-Houses, or the like large Edifices, as ours is to be, which are not to front the Streets, or Lanes, is left to the Discretion of the Architect, so as not to exceed five Stories. Therefore having finished our *Walls*, we'll proceed to the Intermissions, which are either Columns, or Pillars.

We have observed in our Treatise of *Architecture*, that there are five Orders of those Columns, *viz. Tuscan*, *Doric*, *Ionic*, *Corinthian*, and *Composite*; in our Edifice we must take Care, says *Palladio*, that the strongest and most substantial of those Orders, which is the *Tuscan*, may lay undermost; though this Order, on Reason of its Plainness and Simplicity, be seldom used above Ground, except in Fabricks where one Order only is employed, never, therefore, in regular, and sumptuous Edifices, especially Houses, in which the *Doric* supplies its Place, as next to it for Simplicity. In the same Treatise we have plainly demonstrated how those Columns must diminish in Proportion to their Length; and what Care is to be taken to keep a due Proportion and Harmony between the Intercolumnations, or Distances, and the Columns; because if small Columns are made with large Intercolumnations, it will very much diminish the Beauty of the former; for the too great Quantity of Air, in the void Spaces, will lessen their Thickness very much; and that if, on the contrary, we make large Columns and little Intercolumnations, the too small Vacuity, will make them appear heavy, thick, and disagreeable.

We'll also take the same Care, to have our Columns, in the Front, even with respect to their Number; that there may be an Opening in the Middle, which should be larger than the other Intercolumnations, for the Doors and Entries; which Subject has been amply canvassed in our said Treatise of *Architecture*. From this we'll pass to Apertures, which are either Gates, Doors, Windows, Stair-Cases, Chimneys, or Conduits for the Sullage, *&c.*

Palladio pretends, that no settled and determinate Directions can be given for the Altitude, and Breadth of the *Gates* of spacious Edifices; nor for the Doors and Windows of Rooms; and gives this for Reason, that when an Architect makes any Gates, he is forced to adapt them to the Largeness of the Fabrick; to the Dignity of a Person who employs him, and the Conveniency of whatever goes backwards and forwards, either to and from the same; though the Method he likes best is to divide the Space from the Ground to the Superficies of the Joists into three Parts and a Half; two whereof must be allow'd to the Altitude of the Void, or Opening, and one and a Half to the Breadth.

Some will have *Gates*, through which Coaches, *&c.* are to pass, not less than seven Feet Broad, nor more than twelve; the Height to be one and a Half the Breadth.

The *Gates* and principal Doors must be ordered in such a Position that an easy Access from all Parts of the House may be had to them. The Doors of Rooms must not exceed three Foot wide, and six and a half high; nor be less than two Foot wide, and five Foot high. They ought to be as few in Number, and as moderate in Dimensions as possible, since all Openings are Weakenings; though by turning Arches over them, they are discharged, in some Measure, of the super-incumbent Weight. They are not to approach too near the Angles of the Walls; it being a glaring Solecism to weaken that Part which must weaken all the rest. They should be, if possible, right over one another; that Void may be over Void; and Full over Full; and also opposite to each other, so as that one may see from one End of the House to another; which will not only be graceful, but also convenient; as it affords a Means of cooling the House in Summer, by letting in Air; and of keeping out the Wind in Winter, which Way soever it sits.

In small *Buildings*, the Breadth of the *Door* of the Entry should be four Foot, or four and a half; and the Breadth of the *Doors* of the Chambers $3\frac{1}{2}$, $3\frac{3}{4}$, or 4. In middling *Buildings* the Breadth of the Entry *Door* ought to be 5 or 6 Foot; and that of the Chamber *Doors* 4, or $4\frac{1}{2}$.

There are *Gates*, A, and *Doors* of the five Orders, *viz. Tuscan*, *Dorick*, *Ionick*, *Corinthian*, and *Composite Doors*.

Gates and *Doors* have their Heads generally Square, and sometimes Circular, which last must not be used, if the Impost be not above the Height of a Man.

Note, That *Imposts*, in Architecture, are the Capitals of Pillars or Pilasters, which support Arches. An *Impost*, sometimes also called *Chaptrel*, is a Sort of *Plinth*, or little Cornice, which crowns a Peer, and supports the first Stone, whence an Arch or Vault commences. *Imposts* conform to their proper Order. The *Tuscan* is a *Plinth* only; the *Dorick* has two Faces crowned; the *Ionick* a Larmier over the two Faces, and its Moulding may be carved; the *Corinthian* and *Composite* have a Larmier, Freeze, and other Mouldings,

Mouldings. The Projecture of the *Impoſt* muſt not exceed the Naked of the Pilaſter. Sometimes the Entablature of the Order ſerves for the Impoſt of the Arch; and this looks very Grand and Stately. The Impoſt is a Thing eſſential to an Ordonnance; in as much as without it, in the Place where the curve Line of the Arch meets with the perpendicular Line of the Pillar, there always ſeems a Kind of Elbow.

Palladio gives the following Rules for the Decorations of *Doors*, which Decorations conſiſt of the *Architrave*, *Freeze*, and *Cornice*. 1. That the *Architrave* ſhould turn about the *Door*, and be as thick as the Jambs or Pilaſters, which muſt not be leſs than a ſixth Part of the Breadth of the Opening, nor more than a fifth. 2. The Thickneſs of the *Freeze* and *Cornice* is to be taken from the ſame Opening. 3. The *Architrave* muſt be divided into four Parts, three of which are to be for the Altitude of the *Freeze*, and five for that of the *Cornice*. 4. The *Architrave* muſt be again divided into four Parts; three whereof go to the firſt *Faſcia*, four to the ſecond, and the other three are ſubdivided into five Parts; two whereof are for the *Regolo*, or *Orlo*, and the other three are for the *Cima reverſa*, otherwiſe call'd *Cymatium*. Its Projecture is equal to its Altitude, and the Fillet projects leſs than Half its Thickneſs. 5. To deſign the *Cymatium*, we muſt draw a right Line from below the Fillet to the upper Part of the ſecond *Faſcia*, which Line is to be divided into two equal Parts, each whereof is made the Baſe of an iſoceles Triangle, or which has two Sides equal; then the Place of the fix'd Foot of our Compaſs muſt be plac'd in the Angle over-againſt the Baſe, by which we'll draw the curve Lines which give the *Cymatium*.

The *Freeze* ought to be three Fourths of the *Architrave*, and form'd by the Segment of a Circle, leſs than a Semicircle, and its Convexity, or Swelling, is to be perpendicular to the *Cymatium* of the *Architrave*.

The five Parts to be given to the *Cornice*, muſt be thus diſtributed to its Members; one to be for the *Cavetto*, with its *Liſtella*, which is the fifth Part of the *Cavetto*, the Projecture whereof is two Thirds of its Altitude; and an iſoceles Triangle muſt be drawn to deſign it, ſo that the *Cavetto* will be the Baſe of the Triangle. Another of the ſaid five Parts muſt be allow'd to the *Ovolo*, the Projecture whereof ſhall be two Thirds of its Altitude, and is form'd by drawing an iſoceles Triangle. The other three to be ſubdivided into ſeventeen Parts, eight whereof we'll allow to the *Corona* with its *Liſtella's*, of which that above takes one of the ſaid eight Parts, and that below, which makes the Hollow of the *Corona*, muſt have but a ſixth Part of the *Ovolo*. The other nine will be given to the *Cima recta* and its *Fillet*, which will be one Third of the ſaid *Cima*.

Note, That DECORATION, in *Architecture*, is any Thing that adorns and enriches a *Building*. The Orders of *Architecture* contribute greatly to the *Decoration*, but then the ſeveral Parts of thoſe Orders muſt have their juſt Proportions, Characters, and Ornaments; otherwiſe the fineſt Order will bring Confuſion, rather than Richneſs.

As for our other Apertures, which are *Windows*, (*B*) we muſt obſerve the following Rules: 1. That they be as few in Number, and as moderate in Dimenſions, as may conſiſt with other Reſpects; inaſmuch, as we have already obſerv'd, all Openings are Weakenings. 2. That they be plac'd at a convenient Diſtance from the Angles, or Corners of the *Building*; becauſe that Part ought not to be open'd, and infeebled, whoſe Office is to ſupport and faſten all the reſt of the *Building*. 3. Care muſt be taken that the *Windows* be alſo equal one with another, in their Rank and Order; ſo that thoſe on the right Hand may anſwer to thoſe on the left; and thoſe above be right above thoſe below; for this Situation of *Windows* will not only be handſome and uniform, but alſo the Void being upon the Void, and the Full upon the Full, it will be a ſtrengthening to the whole Fabrick.

As to their Dimenſions, Care is to be us'd, neither to give them more or leſs Light than is needful; therefore Regard is to be had to the Bigneſs of the Rooms which are to receive the Light, ſince it is evident that a great Room needs more Light, and conſequently a greater *Window* than a little Room, and *è contra*.

The Apertures of *Windows*, in middle-ſiz'd Houſes, may be four and a Half, or five Feet between the Jambs; and in the greater *Buildings* ſix and a Half, or ſeven Feet; and their Height may be double of the Length, at leaſt; but in high Rooms, or larger *Buildings*, their Height may be a Third, a Fourth, or Half their Breadth, more than double their Length.

Such are the Proportions for *Windows* of the firſt Story; and according to theſe muſt thoſe in the upper Stories be for Breadth; but as to Height, they muſt diminiſh; the ſecond Story may be one third Part lower than the firſt, and the third Story one fourth Part lower than the ſecond.

There are different Sorts of *Windows*, viz. *Architrave Windows*, *Dormer Windows*, or *Luthern*, and *Tranſom Windows*.

Architrave Windows of Timber, are commonly an *Ogee* rais'd out of the ſolid Timber with a Liſt over it; though ſometimes the Mouldings are ſtruck, and laid on, and ſometimes are cut in Brick. *Dormer Windows*, or *Luthern*, are a Kind of *Window* over the *Cornice*, in the Roof of a *Building*, ſtanding perpendicularly over the naked Part of the Walls, and ſerving to illuminate the upper Story. The *French Architects* diſtinguiſh theſe, according to their various Forms; as *ſquare*, *ſemicircular*, *Bull's Eyes*, *flat Arches*, *Flemiſh Lutherns*, &c. *Tranſom Window* is a Double-light *Window*, ſo call'd from the Piece that is fram'd a-croſs it.

Windows, like Doors, vary likewiſe with reſpect to the different Orders of *Architecture*, and have their various Decorations in common with Doors.

Windows and Doors are alſo often adorn'd with *Balconies*, which are a Jutty, or Projecture, in the Front of a Houſe, ſupported by Pillars, or Conſoles, and encompaſs'd with a Balluſtrade; which is an Aſſemblage of one or more Rows of Balluſters, high enough to reſt the Elbow on.

The next Apertures which fall under our Conſideration, are the *Chimneys*.

Chimney, from the *French Cheminee*, is that Part of the Houſe where the Fire is made. The *Chimney* is compos'd of Jambs, or Sides, of the Back or Wood; the Mantle-tree reſting on the Jambs; the Tube, or Funnel, which conveys away the Smoak; the Chimney-piece, or Moulding, on the Fore-ſide of the Jambs over the Mantle-tree, and the Hearth, or Fire-Place. But as we are yet on the Out-ſide of the Houſe, we'll conſider firſt the Funnel, or Tube, which, according to *Palladio*, muſt never be made too wide, or too narrow; for in the former Caſe the Wind having too much Room, will drive the Smoak downward, and not let it aſcend, or go freely out; and in the latter Caſe the Smoak, for want of a free Vent, will fly back again. Therefore in the *Chimneys* of Rooms the Funnels muſt not be narrower than Half a Foot, nor wider than nine Inches, nor above two Foot and a Half in Length. The Mouth of the Pyramid, where it joins to the Funnel, muſt be made ſomewhat narrower, that the Smoak driving downward, it may keep it from going into the Room. Some make the Funnels crooked, that by their winding, and the Strength of the Fire, which forces it upward, they may prevent the Smoak from flying back into the Room. The Funnels, or Openings a-top, ſays the ſame learned Author, through which the Smoak ſhould be convey'd, ought to be wide, and ſet at a Diſtance from any Subſtance that is apt to take Fire.

According to *Wolfius*, the Breadth of the Aperture at Bottom ought to be to the Height, as three to two; to the Depth, as four to two. In ſmall Apartments the Breadth is three Foot, in larger five. In Bed-Chambers four. In ſmall Banquetting-Rooms five and a Half, in large ſix; but the Height never to exceed two and a Half, leſt there be too much Room for the Air and Wind to drive the Smoak into the Room. Nor muſt the Height be too little, leſt the Smoak miſs its Way, and be check'd at firſt ſetting out. The ſame Author adviſes, to have an Aperture thro' which the external Air may, on Occaſion, be let into the Flame, to drive up the Smoak, which the internal Air would otherwiſe be unable to do.

Felibien orders the Mouth of the Tube, or that Part join'd to the *Chimney*-Back, to be a little narrower than the reſt, that the Smoak coming to be repell'd downwards, meeting with this Obſtacle, may be prevented from getting into the Room.

To prevent *ſmoaking Chimneys*, Mr. *Lucar* adviſes two Holes, or two Pipes, one over the other, to be left on each Side of the *Chimney*, one ſloping upwards, the other downwards: Through one of theſe, ſays he, the Smoak will paſs in any Poſition. *De Lorme* will have a braſs Ball full of Water, with a ſmall Aperture, to be hung up in the *Chimney*, at a Height a little above the greateſt Flame: Here, as the Water grows hot, it will rarefy, and drive through the Aperture in a vapoury Stream, which will drive up the Smoak that would otherwiſe linger in the Funnel. Others place a kind of moveable Vane, or Weather-Cock, a-top of the *Chimney*; ſo that what Way ſoever the Wind comes, the Aperture of the *Chimney* will be ſkreen'd, and the Smoak have free Egreſs. Indeed the beſt Prevention of a *ſmoaking Chimney* ſeems to lie in the proper Situation of the Doors of the Room, and the apt falling back of the Back, and convenient gathering of the Wings and Breaſt of the *Chimney*.

Chimneys are made in the Thickneſs of the Wall, and Care muſt be taken that no Timber be laid within twelve Inches of the Fore-ſide of the *Chimney* Jambs, that all Joiſts, on the Back of the *Chimney*, be laid with a Trimmer, at ſix Inches Diſtance from the Back; and that no Timber be laid within the Funnel.

The Antients, in order to heat their Apartments, built their *Chimneys* in the Middle, with Columns, or Conſoles, to uphold the *Architraves*, over which they fix'd the pyramidal Funnel, through which the Smoak was convey'd; though the Obſcurity of the Rules given by *Vitruvius*, on that Head, would make one conclude, that the Antients had no *Chimneys*, but only Stoves, whereof they had entire Apartments. Tho' *Octavio Ferrary* endeavours to prove *Chimneys* in Uſe among them; to this End, he cites the Authority of *Virgil*:

Et jam ſumma procul villarum culmina fumant.

And that of *Apian*, who ſays, that of thoſe Perſons proſcrib'd by the *Triumvirate*, ſome hid themſelves in Wells, and common-Shores; ſome in the Tops of Houſes and *Chimneys*: For ſo he underſtands καπνωδεις ὑπωροφιας, *fumaria ſub tecto poſita*. *Ariſtophanes* ſeems to be of the ſame Sentiment in one of his Comedies, wherein he introduces his old Man *Polycleon* ſhut up in a Chamber; whence he endeavours to make his Eſcape by the *Chimney*.

Palladio pretends, that the Stoves of the Antients, us'd inſtead of *Chimneys*, conſiſted of certain Tubes, or Pipes, in the Thickneſs of the Wall, through which the Heat of the Fires, which were made under thoſe Chambers, aſcended, and iſſued out through certain Vents, or Mouths, at the Top of the ſaid Tubes, or Funnels.

In the Year 1713, was publiſh'd a *French* Book, intituled, *La Mechanique du feu*, or The Art of augmenting the Effects, and diminiſhing the Expence of Fire, by M. *Gauger*; ſince tranſlated into *Engliſh*, by the celebrated Dr. *Deſaguliers*. Wherein the Author examines what Diſpoſition of *Chimnies* is moſt proper to augment the Heat, and proves geometrically, that the Diſpoſition of parallel Jambs, with the Back inclin'd, as in the common *Chimneys*, is leſs fitted for reflecting Heat into the Room, than parabolical Jambs, with the Bottom of the Tablette horizontal. He gives ſeveral new Conſtructions of his new *Chimneys*, and the Manner of executing them.

Note, That CHIMNEY-JAMBS are the Sides of a *Chimney* uſually ſtanding out perpendicularly, ſometimes circularly from the Back; on the Extremities whereof the Mantle-tree reſts.

Having finiſh'd our *Chimney*, we'll paſs to one of the moſt conſiderable of our Apertures, which is the STAIR-CASE, (*C*) defin'd an Aſcent inclos'd between Walls, or a Baluſtrade, conſiſting of Stairs, or Steps, with Landing-places, and Rails; ſerving to make a Communication between the ſeveral Stories of a Houſe.

We muſt be very curious in placing our *Stair-Caſe*, ſince it is difficult to find a convenient Place for it, which, at the ſame Time, will no ways damage the reſt of the Fabrick. A proper Situation, therefore, muſt be aſſign'd to it, that it may not interfere with any other Parts of the Houſe, nor receive any Inconvenience from them.

The common Rules to be obſerv'd in *Stair-Caſes*, are as follow: 1. They muſt have three Openings; the firſt of which is the Door by which we go up to them, which the leſs it is conceal'd from ſuch as enter the Houſe, the more ornamental it will appear; and, in *Palladio*'s Opinion, it ſhould be plac'd in ſuch a Manner, that before we come at it we may have a Sight of the beſt Part of the Houſe; for then the Edifice, though little in Reality, will appear large; for which Reaſon, it muſt be obvious, and eaſy to be found. The ſecond Opening is the Windows requiſite to light the *Stair-Caſe*, and which muſt be ſituated in the Middle, and made high, by which Means they will diffuſe the Light in equal Proportion. The third Opening is the Landing-place, through which we enter into the Rooms of the firſt Story, and muſt lead into the moſt handſome, ſpacious, and beſt furniſh'd Rooms of the Houſe.

2. *Stair-Caſes* muſt be made ſpacious in Proportion to the Bigneſs and Quality of the Building, and never narrower than four Foot, that when two Perſons meet, they may have Room enough to paſs. They will be commodious, with reſpect to the whole Fabrick, ſays *Palladio*, if Arches large enough to hold Goods, *&c.* be made under the Steps; and if they be made wide, and of an eaſy Aſcent, it will be more commodious to thoſe who go up and down; their Tread therefore muſt be double their Height.

3. The Steps muſt be no more than ſix Inches ſteep, and if they ſhould be leſs, eſpecially if the *Stair-Caſes* are long, and have no Landing-places, it will make them ſtill more convenient, and leſs tireſome, by not obliging People to lift their Feet ſo high; but then they muſt be four Inches ſteep, at leaſt. The Breadth of the Steps muſt not be more than one Foot and a Half, nor leſs than a Foot.

The Antients, in the Steps of their *Stair-Caſes*, took particular Care to make their Number odd, that when they began to go up with the right Foot, the ſame might be uppermoſt when they came to the Top, which they imagin'd was a propitious Omen, and a Teſtimony of more religious Awe and Reverence, when they enter'd their Temples. However, *Palladio* is of Opinion, that eleven, or thirteen Steps, at moſt, are enough for a Flight; and that in caſe, when we are got ſo high, we muſt ſtill go further, then a Landing-place ought to be made, that ſuch Perſons as may be over-weary, or tir'd, may reſt themſelves; and that when any Thing happens to fall from above, it may thereby be ſtopp'd, and prevented from rolling any lower.

The

The Kinds of *Stair-Caſes* are various; for in ſome the *Stairs* are ſtraight, in others winding; in others both Ways, or mixt: Again, of ſtraight *Stair-Caſes*, called alſo, *Flyers*, ſome fly directly forwards; others are ſquare; others triangular; and others are called *French-Flights*.

For the making of ſtraight *Stair-Caſes*, the whole Space muſt be divided into four Parts; two whereof muſt be allowed to the Steps, and the other two to the Void in the Middle; whence the *Stair-Caſe*, in Caſe it were left open, will receive the Light. They may be made with the Wall inward, and then the Wall itſelf, is incloſed in the two Parts, which are allowed to the Steps; though there be no abſolute Occaſion for this.

Direct-Flyers, or *Plain-Flyers*, are thoſe which proceed directly from one *Floor* to another, without turning either to the Right or Left; ſeldom uſed, except for Garret, or Cellar *Stairs*. Square *Flyers*, are thoſe which fly round the Sides of a ſquare Newel, either ſolid or open; having at every Corner of the Newel, a Square half Step, taking up one fourth of a Circle, ſo that they fly from one half Step to another; and the Length of the *Stairs*, is perpendicular to the Side of the Newel. *French-Flyers*, fly, firſt directly forwards, 'till they come within the Length of a *Stair*, of the Wall; and then have a Square half Pace, from which you immediately aſcend to another half Pace; from which the *Stairs* fly directly back again, parallel to their firſt Flight.

Of *Winding-Stairs*, called alſo *Spiral-Stairs*; ſome are Square, ſome Circular, and ſome Eliptical: And theſe again, are various, ſome winding round a Solid, and others an open Newel.

There are four Kinds of Circular *Winding-Stairs*, viz. ſuch as wind about a ſolid Newel; the Fore-edge of each being in a right Line, pointing to the Centre of a Newel; commonly uſed in Church Steeples, and great old Houſes. Such as wind round an open Newel, the Fore-ſide of each being in a right Line, pointing to the Centre of the Newel; as thoſe in the Monument of *London*. Such as wind round a ſolid Newel, only the Fore-ſide of each, an Arch of a Circle; either Concave, or Convex, pointing near to the Circumference of the Newel. And ſuch as reſemble the Laſt, in all other Reſpects, ſave that they have an open Newel. Any of theſe *Winding-Stairs*, take up leſs room than other Kinds.

When a *Stair-Caſe* winds round a ſolid Newel, or a Column, *Palladio* will have it made in the Manner following: The Diameter being divided into three Parts, two muſt be for the Steps and one for the Newel; or the Diameter ſhall be divided into ſeven Parts, three of which are to be allowed to the Newel, and the four others to the Steps; and in Caſe the *Stair-Caſes* be made circular, they will appear very ornamental, and be longer, than if they had been made ſtraight. But in open *Stair Caſes*, the ſame celebrated *Architect*, divides the Diameter into four Parts, two of which he gives to the Steps, and two to the Void in the Middle.

He divides *Eliptical*, and Circular *Stair-caſes*, in one and the ſame Manner, and judges them very handſome, and agreeable, all the Windows and Doors being at the Head, and in the Middle of the *Elipſis*. There is at *Chambor* near *Blois* in *France*, a Winding *Stair-Caſe*, made by the Direction of *Francis* I. King of *France*, conſiſting of four *Stair-Caſes*, carried up together, having each its ſeveral Entrance, and going up one over another, in ſuch Manner, as that being in the Middle of the *Building*, the four ſerve to lead to four Apartments, ſo that the People of the one, needs not go up and down the *Stairs* of the other; yet being opened in the Middle, they all ſee each other.

Palladio mentions another Kind of *Stair-Caſes*, in the Portico of *Pompey* at *Rome*, in the Way that leads to the Quarter of the *Jews*; which conſiſts of three Winding *Stairs*, of a very pretty and artful Invention; for being placed in the Middle of the *Building*, whence they could receive no Light but from above; they were ſet upon Columns, to the End that the Light might be equally diffuſed; in Imitation whereof *Bramante*, a celebrated *Architect* in his Time, made one in the *Belvidera*, but without Steps; and compoſed it of the four Orders following, *viz.* the *Dorick*, *Ionick*, *Corinthian*, and *Compoſite*. This Kind of *Stair-Caſe*, is made, by dividing the Square into four Parts; two of which are given to the Void in the Middle, and one to each Side of the Steps, or Columns.

Mixt-Stairs, are ſuch as partly fly, and partly wind; whence ſome call them *Flyers*, and *Winders*: Of theſe are ſeveral Kinds; as, *Doglegged-Stairs*, which, firſt, fly directly forwards, then wind a Semicircle; and then fly directly backwards, parallel to that. *Square-Flyers* and *Winders*, which have a ſquare Newel, either ſolid, or open, and fly by the Sides of the Newel; winding a Quadrant of a Circle, at each Corner. *Solid* and *open Newelled-Flyers*, and *Winders*, which are of two Kinds; the one winds a Quadrant of a Circle of about a ſolid Newel, then flies by the Side of a Square open Newel; then winds again, by the Side of a ſolid Newel; then flies again, and ſo alternately. The other flies firſt, then winds, and then flies again alternately.

Several Modern *Architects*, eſpecially the *French*, have introduced *Twiſted-Rails*, in many of their *Stair-Caſes*; which are formed in the following Manner:

When we have made our Plan, and thereby found the Breadth, or Tread of the Steps, and have alſo fixed on the Bigneſs of the intended *Rail*, with the Form and Projection of the Mouldings; then the Front of the ſecond Step, muſt be continued out farther, and thereon a Circle deſcribed, touching the Inſide of the *Rail*, and whoſe Diameter muſt be equal to the Breadth of two Steps, which we'll divide into eight equal Parts; then we'll deſcribe on the Centre of the ſaid Circle, another Circle, equal to the Bigneſs of the *Rail*, and alſo another Circle to the Extremities of the Mouldings.

If we draw a diagonal Line, and deſcribe the Part of a Circle, and, dividing it into eight equal Parts, continue it from the Center to the Line, we have the diminiſhing Scale for the Formation of the *Scroll*. Then transferring the reſpective Diſtances, within the great Circle, on each eighth Part thereof, and finding the Center of the Eye, or Block, for the firſt eighth Part of the *Scroll*, and proceeding from thence to all the Diſtances, we have the whole *Scroll* compleated, and finiſhing in the Block, at one *Revolution* of a Circle. But here it is to be obſerv'd, that the in-ſide *Scroll*, though drawn from the ſame Centers, muſt not meet on the aforeſaid eight Parts of the great Circle, but a Line drawn from the outer *Scroll* to each Center reſpectively.

For forming the Scroll of the firſt *Step*, the ſame Method is to be us'd as above; obſerving, only, that as it begins to be circular from the ſecond eighth Part, the Diſtance to the *Rail* muſt be divided into ſeven Parts, and gathering in, one at a Time, it will be compleated.

Should it be requir'd to make the *Scroll* of a larger *Revolution*, we muſt deſcribe a Circle whoſe Diameter is equal to three *Steps*, and divide the diminiſhing Scale into twelve Parts; and by proceeding, as before, to ſtrike one Eighth of the great Circle at a Time, we have the *Scroll* at one *Revolution* and a Half of a Circle. But wanting it ſtill larger, we'll make a Circle whoſe Diameter is equal to the Breadth of four *Steps*, and the diminiſhing Scale divided into ſixteen Parts, the *Scroll* will be form'd at two *Revolutions* of the Circle.

Having carried the Walls as high as we are determin'd they ſhall go, having made the Vaults, laid the Joiſts of the Floors, (which *Joiſts* are thoſe Pieces of Timber fram'd into the Girders and Summers, on which the Boards of the Floor are laid) brought up the *Stair Caſes*, &c. in the next Place we muſt raiſe the

the *Roof*, (*D*), which, as it embraces all the Parts of the Fabrick, and preſſes the Walls thereof equally with its Weight, is, by that Means, a kind of Bandage to the whole, and ſerves not only to ſhelter ſuch as live in the Houſe from Rain, Snow, the Sun's burning Rays, and the Vapours which riſe in the Night; but is alſo of great Service to the whole Edifice, as it carries off the Rain from the Walls, which although it be imagin'd of but ſmall Detriment to the Fabrick, will, notwithſtanding, in Proceſs of Time, be found to be very prejudicial to it.

Note, That the JOISTS are from ſix to eight Inches ſquare, and ought ſeldom to lie at a greater Diſtance from each other than ten Inches, never twelve; nor ought they ever to bear at a greater Length than ten Foot, or to lie leſs into the Wall than eight Inches. Sometimes Carpenters furr their *Joiſts*, as they call it; that is, lay two Rows of *Joiſts* one over the other. *Summer* is a large Stone, the firſt that is laid over Columns and Pilaſters, in beginning to make a croſs Vault; or it is the Stone which being laid over a *Piedroit*, or Column, is hollow'd to receive the firſt Haunce of a Plat-band. *Girders* are the largeſt Pieces of Timber in a *Floor*; their Ends are uſually faſten'd into the *Summers*, or *Breaſt-Summers*; and the *Joiſts* are fram'd in at one End to the *Girders*. By the *Statute* for rebuilding *London*, no *Girder* is to lie leſs than ten Inches into the Walls; and their Ends to be always laid in Loam, *&c.*

Palladio will have *Roofs* made more or leſs ſhelving, according as the Climate is either hot or cold; for which Reaſon, in *Germany*, ſays he, where the Snow falls in great Quantity, the *Roofs* are made very ſharp, and are cover'd with Shingles, or little thin Pieces of Wood, or elſe with very thin Tiles; for otherwiſe the Weight of the Snow would cruſh them. But thoſe who live in gentle and moderate Climates ſhould raiſe their *Roofs* with Grace and Politeneſs, and to ſuch an Altitude, as that the Rain may eaſily roll off. Therefore the Breadth of the Plate to be *roof'd*, continues he, muſt be divided into nine Parts; two whereof ſhall be the Pitch; for if it were made of one Fourth of the Breadth, the *Roof* would be too ſharp, ſo that the Tiles would ſcarce cleave; and if they were made but of a fifth Part, the *Roof* would be too flat, whereby the ſuperincumbent Weight of the Tiles, Shingles, and Snows, would preſs too much upon it. He concludes, by obſerving, that Gutters are uſually made all round the Houſe, into which the Water which falls from the Tiles is convey'd away, by Spouts, at a conſiderable Diſtance from the Walls. That the Gutters muſt have a Foot and a Half of Wall over them, which will not only keep them in much ſtronger, but likewiſe preſerve the Timber in the *Roof* from any Damage which the Rains might otherwiſe occaſion.

When the *Roof* is *pointed*, its moſt beautiful Proportion is, to have its Profile an equilateral Triangle; when *ſquare*, that is, when the Pitch, or Angle of the Ridge, is a right Angle, it muſt be conſider'd as a mean Proportion between the pointed and the flat Form. A *flat Roof* is that in the Form and Proportions of a triangular Pediment. Sometimes the *Roof* is in the Pinnacle Form; ſometimes it has a double Ridge; ſometimes it is cut, or mutilated, that is, conſiſts of a true and a falſe *Roof* laid over the former; ſometimes it is truncated, that is, inſtead of terminating in a Ridge, or Angle, it is cut ſquare off at a certain Height, and cover'd with a Terraſs, and ſometimes, alſo, encompaſs'd with a Balluſtrade. Sometimes it is in Manner of a Dome, that is, its Plan is ſquare, and the Contour circular; ſometimes it is round, that is, the Plan is round, or oval, and the Profile ſpherical. Sometimes the Baſe being very large, it is cut off to diminiſh its Height, and cover'd with a Terraſs of Lead, rais'd a little in the Middle with Sky-lights, from Space to Space, to give Light to ſome Corridore, or other intermediate Piece, which without ſuch an Expedient would be too dark.

There is alſo the *Hip Roof*, which is a *Roof* which has neither Gable-Head, nor Shread-Head, nor Jirkin-Head; which laſt are both gable and hip at the ſame End. A *Hip-Roof* has Rafters as long, and with the Angles at the Foot, *&c.* at the End of *Buildings*, as it has at the Sides; and the Feet of the Rafters on the End of ſuch *Buildings* as have *Hip Roofs*, ſtand on the ſame Plan, *viz.* parallel with the Horizon, and at the ſame Height from the Foundation with Rafters on the Sides of the *Roof*.

All Kinds of *Roofs* are compos'd of *Beams*, *Rafters*, *Hips*, &c. A *Beam* is the largeſt Piece of Wood in a *Building*, being laid a-croſs the Walls, and ſerving to ſupport the principal *Rafters* of the *Roof*. No Houſe has leſs than two of theſe *Beams*, *viz.* one at each Head: Into theſe the Girders of the Garret-Floor are alſo fram'd; and if the *Building* be Timber, the Teazle-tenons of the Poſts.

The Proportions of *Beams*, near *London*, are fix'd by Statute as follows: A *Beam* 15 Foot long muſt be ſeven Inches on one Side its Square, and five on the other; if it be 16 Foot long, one Side muſt be eight Inches, the other ſix; if 17 Foot long, one Side muſt be ten Inches, the other ſix. In the Country they uſually make them ſtronger. Sir *H. Wotton* adviſes theſe to be of the ſtrongeſt, and moſt durable Timber.

The *French*, under *Poutre*, *Beam*, take in not only the Pieces which ſupport the Rafters, but alſo thoſe which ſuſtain the Joiſts for the Cieling. Some of their beſt Authors have conſider'd the Force, or Strength of *Beams*, and brought their Reſiſtance to a preciſe Calculation; particularly M. *Varignon*, and M. *Parent*. The Syſtem of the latter is as follows:

When in a *Beam* breaking parallel to its Baſe, which is ſuppos'd to be a Parallelogram, two Plans of Fibres, which were before contiguous, are ſeparated, there is nothing to be conſider'd in thoſe Fibres, but their Number, Bigneſs, Tenſion before they broke, and the Lever by which they act; all theſe together making the Strength or Reſiſtance of the *Beam* to be broke. Suppoſe, then, another *Beam* of the ſame Wood, where the Baſe is likewiſe a Parallelogram, and of any Bigneſs, with regard to the other, at Pleaſure; the Height, or Thickneſs of each of theſe, when laid horizontal, being divided into an indefinite Number of equal Parts, and their Breadth into the ſame Number, in each of their Baſes, will be found an equal Number of little quadrangular Cells, proportional to the Baſes whereof they are Parts. Theſe, then, will repreſent little Baſes, or, which is the ſame Thing, the Thickneſs of the Fibres to be ſeparated for the Fracture of each *Beam*; and ſince the Number of Cells is equal in each, the *Ratio* of the Baſes of both *Beams* will be that of the Reſiſtance of their Fibres, both with regard to Number and Thickneſs. Now the two *Beams* being ſuppos'd of the ſame Wood, the Fibres moſt remote from the Points of Support, which are thoſe which break the firſt, muſt be equally ſtretch'd when they break. Thus the Fibres, *v. gr.* of the tenth Diviſion, are equally ſtretch'd in each Caſe, when they firſt break; and in whatever Proportion the Tenſion be ſuppos'd, it will be ſtill the ſame in both Caſes; ſo that the Doctrine is entirely free, and unembarraſs'd with any phyſical Syſtem.

Laſtly, It is evident, the Levers whereby the Fibres of the two *Beams* act, are repreſented by the Height or Depth of their Baſes; and, of Conſequence, the whole Reſiſtance of each *Beam* is the Product of its Baſe by its Height; or, which is the ſame Thing, the Square of the Height multiplied by the Breadth: Which holds, not only in caſe of parallelogrammatick, but alſo in elliptick Baſes. Hence if the Baſes of two *Beams* be equal, though both their Heights and Breadths be unequal, their Reſiſtance will be as the Heights alone; and, by Conſequence, one and the ſame *Beam*, laid on the ſmalleſt Side of its Baſe will

will reſiſt more than when laid flat, in Proportion as the firſt Situation gives it a greater Height than the ſecond: And thus an elliptick Baſe will reſiſt more, when laid on its greateſt Axis, than on its ſmalleſt.

Since in *Beams*, equally long, it is the Baſes that determine the Proportion of their Weights, or Solidities; and ſince their Baſes being equal, their Heights may be different; two *Beams*, of the ſame Weight, may have Reſiſtances differing to Infinity. Thus if in the one the Height of the Baſe be conceiv'd infinitely great, and the Breadth infinitely ſmall, while in the others the Dimenſions of the Baſe are infinite, the Reſiſtance of the firſt will be infinitely greater than that of the ſecond, though their Solidity and Weight be the ſame. If, therefore, all requir'd in *Architecture* were to have *Beams* capable of ſupporting vaſt Loads, and, at the ſame Time, be of the leaſt Weight poſſible, it is plain they muſt be cut thin as Laths, and laid edge-wiſe. If the Baſes of two *Beams* be ſuppos'd unequal, but the Sum of the Sides of the two Baſes equal, *v. gr.* if they be either 12 and 12, or 11 and 13, or 10 and 14, *&c.* ſo that they always make 24; and further, if they be ſuppos'd to be laid edge-wiſe; purſuing the Series, it will appear, that in the *Beam* of 12 and 12, the Reſiſtance will be 1728, and the Solidity, or Weight, 144; and that in the laſt, or 1 and 23, the Reſiſtance will be 529, and the Weight 23. The firſt, therefore, which is ſquare, will have leſs than Half the Strength of the laſt, with regard to its Weight.

Hence M. *Parent* remarks, that the common Practice of cutting the *Beams* out of Trees, as ſquare as poſſible, is ill Huſbandry; and hence takes Occaſion to determine geometrically what Dimenſions the Baſe of a *Beam*, to be cut out of any Tree propos'd, ſhall have, in order to its being of the greateſt poſſible Strength; or, which is the ſame Thing, a circular Baſe being given, he determines the *Rectangle* of the *greateſt Reſiſtance* that can be inſcrib'd, and finds, that the Sides muſt be nearly as 7 to 5, which agrees with Obſervation. Hitherto the Length of the *Beam* has been ſuppos'd equal; if it be unequal, the Baſes will reſiſt ſo much the leſs, as the *Beams* are longer.

To this it may be added, that a *Beam* ſuſtain'd at each End, breaking by a Weight ſuſpended from its Middle, does not only break at the Middle, but alſo at each Extreme; or if it does not actually break there, at leaſt immediately before the Moment of Fracture, which is that of the Equilibrium between the *Reſiſtance* and the *Weight*, its *Fibres* are as much ſtretch'd at the *Extremes*, as in the *Middle*. So that of the Weight ſuſtain'd by the *Middle*, there is but one third Part which acts at the *Middle* to make the Fracture; the other two only acting to induce a Fracture in the two *Extremes*. A *Beam* may be ſuppos'd loaden only with its own Weight, or with other foreign Weights apply'd at any Diſtance, or only with thoſe foreign Weights; ſince, according to M. *Parent*, the Weight of a *Beam* is not ordinarily above a 70th Part of the Load given it to ſuſtain, it is evident that in conſidering the ſeveral Weights, they muſt all be reduc'd, by the common Rules, to one common *Center* of *Gravity*. M. *Parent* has calculated *Tables* of the *Weights* that will be ſuſtain'd in the *Middle*, in *Beams* of various *Baſes* and *Lengths*, fitted at each End into Walls, on a Suppoſition that a *Piece* of *Oak* of an Inch ſquare, and a Foot long, retain'd horizontally by the two *Extremes*, will ſuſtain 315 Pounds in its *Middle* before it breaks, which it is found, by *Experience*, it will.

Rafters are Pieces of *Timber*, which ſtanding by Pairs upon the Reaſon, meet in an Angle at the Top, and form the Roof. No *Rafters* ſhould ſtand farther than 12 Inches from one another. For the Sizes, or Scantlings of *Rafters*, it is provided, by Act of Parliament, that *principal Rafters*, from 12 Foot 6 Inches, to 14 Foot 6 Inches long, be 5 Inches broad a-top, and 8 at the Bottom, and 6 Inches thick; thoſe from 14 Foot 6 Inches, to 18 Foot 6 Inches long, to be 9 Inches broad at the Foot, 7 at the Top, and 7 thick; and thoſe from 18 Foot 6 Inches, to 21 Foot 6 Inches, to be 10 Inches broad at the Foot, 8 at the Top, and 8 thick. *Single Rafters* 6 Foot 6 Inches long, to be 4 Foot, and 3 Inches, in their Square; thoſe 8 Foot long, muſt be $4\frac{1}{2}$, and $3\frac{3}{4}$ Inches Square.

The *Hips* are thoſe Pieces of *Timber*, plac'd at the Corners of the Roof. The *Hips* are much longer than the *Rafters*, by reaſon of their oblique Poſition, and are plac'd not with a right or ſquare Angle, but a very oblique one; and, by Conſequence, are not, at leaſt ought not to be ſquare at any Angle, (as *Rafters* are at all) but *bevel* at every one of them; and, which is yet more, as *Rafters* have but four Plains, theſe commonly have five. *Hips* are call'd by Country Workmen *Corners*; ſome call them *principal Rafters*, and others *Sleepers*. Indeed *Hips* and *Sleepers* are much the ſame, only the *Sleepers* lie in the Vallies, and join a-top with the *Hips*; but thoſe Surfaces, or Plains, which make the Back of the *Hips*, are the under Sides of the *Sleeper*. The *Backs* of a Heap, are thoſe two *Superficies*, or Plains, on the Out-ſide of the *Hips*, which lie parallel, both in Reſpect of their *Length*, and *Breadth*, with the *Superficies* of the adjoining Sides, and End of the Roof.

The higheſt Part of the Roof, or rather the Piece of Wood wherein the *Rafters* meet, is call'd the *Ridge* of the Roof.

Having thus accompliſh'd the outward Caſe of our whole *Edifice*, the next Thing we are to do, is, to diſtribute our Ground-Plot into Apartments; in which Diſtribution Regard muſt be had to *Gracefulneſs*, and *Uſefulneſs*, for Rooms of *Office*, and *Entertainment*, as far as the Capacity thereof, and the Nature of the Country, will allow.

The *Gracefulneſs* conſiſts in a double *Analogy*, or *Correſpondency*, firſt, between the Parts of the whole, whereby a large Fabrick ſhould have large Partitions, Entrances, Doors, Columns, and, in brief, all the *Members* large; the ſecond between the Parts themſelves, with Regard to *Length*, *Breadth*, and *Height*.

Palladio will have a *Building* diſpos'd and order'd in ſuch a Manner, as that the moſt noble and beautiful Parts of it be the moſt expos'd to all Spectators, and the leſs agreeable thrown into By-places, and remov'd, as much as poſſible, from publick View; becauſe the Refuſe of the Houſe, or whatever may produce any ill Effect, or Incumbrance, ought to be carried thither; and for this Reaſon the Cellars, Woodhouſes, Pantries, Kitchen, Servants Hall, Laundries, Ovens, and other Offices, which are for ever in Uſe, ſhould, in his Opinion, be plac'd in the lower Part of the Edifice, and which, for the Generality, ſhould be order'd a little under Ground. He ſays, that there are two Advantages attending this Diſtribution: The firſt is, that the Apartment above is altogether free from the Embarraſments and Incumbrances beforemention'd; and the ſecond, which is of equal Importance with the former, is, that the ſaid Apartment is thereby much more wholſome, the Floor thereof being free from the Moiſture of the Ground, beſides that its being high, renders it more beautiful, and contributes towards a more agreeable Proſpect.

The *Uſefulneſs* conſiſts in having a conſiderable Number of Rooms of all Kinds, with Entries, Halls, and light Stair Caſes, which muſt be made ſpacious, and eaſy, as we have already obſerv'd, to go up and down; and the *meaneſt*, and *leſs graceful* of them, ſituated advantagiouſly, to ſerve the other more ſpacious Apartments. The Rooms muſt be large, moderate, or middle-ſiz'd, and ſmall, and all contiguous to one another. *Convenient Partitions* muſt be likewiſe contriv'd for *Cloſets*, *Libraries*, *Horſe Furniture*, and other Things which are in daily Uſe, and which would appear *very indecent* in a *Bed-Chamber*, *Dining-Room*, or other Place ſet a part for the *Reception* of *Strangers*.

Palladio orders the *Summer Rooms* to be ſpacious, and open to the *North*; and the *Winter* ones ſmall, and expos'd to the *South*, and *Weſt*; becauſe in *Summer*,

mer, says he, the Air and Shade is *very agreeable*; and in *Winter* the Sun: Besides, little Rooms are easier warm'd than large ones. But the Rooms intended for *Spring* and *Autumn*, ought to be towards the *East*, and have their *Prospect* towards *Greens* and *Gardens*. *Studies* and *Closets* should likewise have the same *Prospect*, because the Morning is the *best Time* for *Amusement* in such Places. But, concludes he, because it generally happens that in Cities either the Party-Walls, the Streets, or publick Places, *confine* and *restrain* an *Architect* within certain Limits, beyond which he has no *Power* to go; *Necessity*, therefore, obliges him to suit himself according to the Situation of the Place.

In the Partition, an Architect has often Occasion for several Shifts; through which, his own Sagacity, more than any Rules, must conduct him. Thus he is frequently put to struggle with Scarcity of Ground; sometimes to damn one Room, for the Benefit of the rest; as to hide a Buttery under a *Stair-Case*, &c. at other Times, to make those the most beautiful, which are most in Sight; and to leave the rest, like a Painter in the Shadow, *&c.*

Since the *Hall*, or, *Salle*, is properly the First, and finest Partition of an Apartment, and is placed at the Entrance of a fine House, Palace, or the like; it therefore deserves, first, our Attention.

Vitruvius mentions three Sorts of *Halls:* The *Tetrastyle*, which has four Columns supporting the Plat-form, or Cieling: The *Corinthian*, which has Columns all around, let into the Wall, and is vaulted over; and the *Egyptian*, which had a Peristyle of insulated *Corinthian* Columns, bearing a second Order with a Cieling. These were called *Occi*.

To make a *Tetrastyle* Hall, according to *Palladio*'s Design; its Length should be divided into five equal Parts, three thereof must be allowed to the Breadth. The Wings (that is, the Space between the Wall and the Pillars, or Columns, which is not included in the Breadth of the Hall) have in Breadth a fifth Part of the Altitude of the Columns. The Columns, of what Order, please most the Architect, and which he thinks most proper for the Ornament and Magnificence of the *Hall*; which, commonly is the *Corinthian*. The Diameter of those Columns, ought to be equal to the Breadth of one half of the Wings: The Opening above, one third Part of the Breadth of the *Hall*.

The Length of a *Corinthian-Hall*, should be the Diagonal of its Square; and the Wings have in Breadth, two sevenths of the Length of the *Hall*, that is, one for every Wing; the Diameter, and Height of the Columns, in Proportion; as well as the Opening in the Middle.

The *Egyptian-Halls*, are very much like *Basilicas*, or the Courts of Justice of the Antients; because they have a Portico, in which the Columns are distant from the Wall, like in the *Basilicas*; and upon these Columns, are placed the Architrave, Freeze, and Cornice. The Space, or Distance between the Columns and the Wall, is covered with a Platform, surrounded by a Corridor with Rails, and Balluster. Above the said Pillars there is a continued Wall, with half Columns, on the Inside of it, one fourth Part less than the lower Ones. The Windows which give Light to the *Hall*, and through which, when laid open, such as are on the Platform, can look into it, are placed between the said half Columns.

The Antients had another Sort of *Hall*, called *Testitudinated*; that is, made in a Form of a *Tortoise*. The Length of a *Testitudinated-Hall*, is equal to the Diagonal of its Square, and has its full Breadth in Height; which reaches as far as the Summer, or Architrave of the Roof. The Rooms on the Side are six Foot less in Height; and above the Walls, which separate them from the *Hall*, there are Columns, which bear the Roofs of the said *Hall*. Between these Columns, there are some Apertures, or Windows, which give Light to the *Hall*. A little farther are the *Peristylos*, about which are Piazzas, that are the Height of the Columns. The Chambers are of the same Breadth, and their Height to the Imposts of the Arches, is equal to their Breadth; as the Arches have in Height the third Part of their Diameter.

Halls are proper for the Solemnizations of Weddings, Balls, Banquets, Plays, *&c.* for which reason they must be made much larger than any other Apartments; and be contrived, that a numerous Company may, without Inconvenience, be entertained in them, and be Spectators of all that passes. The Length of *Halls* should never exceed twice their Breadth; but the nearer they are to a Square, the more uniform and commodious they will be.

We must not confound *Halls*, with *Entries*, tho' we often give to *Entries*, the Name of *Halls*; though *Entries* be in the lower Parts of the House, and *Halls* in the upper. *Entries* are but a Sort of Landing-place, with which all the other principal Parts of the House have a Communication, and where Persons wait till the Master of the House appears; and after the *Galleries*, are the first Places that present themselves to such as enter the House.

The *Galleries*, are covered Places in a House, much longer than broad; which serve to walk in. If there be but one, 'tis usually made in the fore, or back Front of an Edifice; if two, in the Wings. They are either large, or small, as Conveniency, and the Quality of the *Building*, may require; but they should never be above twenty Foot broad; or less than ten. The *Galleries* of the *Louvre* are magnificent.

Note, *Favot*, in his *Architecture*, derives the Word GALLERY, from *Gaul*, supposing the Antient *Gauls*, to have been the First who used them. *Nicod* fetches it from the *French*, *Aller*, to go. Others bring it from *Galere*, *Galley*, by reason it bears some Resemblance thereto, in Respect of Length. In the corrupt *Latin* we meet with *Galilæa*, for the *Gallery* of a Monastery.

The *Rooms* must be distributed equally, on each Side of the *Entry*, and the *Hall*; and Care must be taken that those on the right Hand, answer to, and be of an equal Largeness, with those on the left, whereby there will be a just Harmony, and Proportion in the several Parts of the Edifice; and the Wall will be in equal Proportion pressed by the Roof: For if the Apartments are bigger on one Side the Edifice, than on the other; in the former Case they will resist the Weight with Ease, because of the Solidity, and Thickness of the Walls; but in the latter they will be too weak, which will create great Inconveniencies, and at last, destroy the whole Structure.

Palladio says, that in the Designing of *Rooms*, there are seven beautiful Proportions; for either they are made round or square; but that the former is now entirely neglected, and laid aside; or their Length is the Diagonal of their Square; or of one Square, and a Third; or a Square, and a Half; or a Square, and two Thirds; or lastly, of two Squares.

For the Altitude of *Rooms*, it must be taken from the different Form of the Cieling; which is either arched or flat. If flat, the Altitude from the *Floor* to the *Joists*, must be in equal Proportion to their Breadth; and the *Rooms* over them, must be a sixth Part lower than those beneath. If arched, as they usually are in the first Story (for this gives them a Grace and Beauty, and renders them less liable to Fire) their Altitude, in square *Rooms*, is a third Part more than the Breadth of the *Rooms*. But in those, where the Length exceeds the Breadth; an Altitude must be sought equal to their Length, and Breadth; and dividing the whole into two equal Parts, one of which will be the exact Altitude of the Arch. Or if the Chambers, to be arched, be twelve Foot in Length, and six in Breadth, we must add the two Numbers together, and the Sum is eighteen, which divided by two, gives nine, and this is the Altitude of the Arch required.

Another Method of finding the Altitude of a *Room* by Numbers, is, by finding (after the Length, and

Breadth of the Room has been given) a Number that bears the ſame Proportion to the Breadth, as the Length does to it; which is performed by multiplying the leſſer Extreme by the greater, and the ſquare Root of the Product, will be the Height. For Example, ſuppoſe the Place to be arched be nine Foot long, and five Foot broad, the Altitude of the Arch will be ſix Foot; and the ſame Proportion that nine has to ſix, ſix has to four. But however we muſt obſerve, that this Altitude cannot always be found by Numbers.

To find in Numbers, another Altitude, which though it be leſs, will ſtill be in Proportion to the *Room*; we muſt firſt have found by the Length and Breadth of the Chamber, its Altitude, according to the firſt Rule; which in the foregoing Inſtance was nine, and having added the Length, Breadth, and Altitude together, we'll multiply the nine by twelve, and afterwards by ſix; ſetting the Product, made by twelve, under twelve, and the Product made by ſix, under ſix; when this is perform'd, we'll multiply ſix by twelve, and ſet the Product thereof, which is 72, under 9; laſtly, having found a Number, that multiplied by 9, produces 72, which in this Inſtance will be eight; eight Foot muſt be the Altitude of the Arch. Theſe ſeveral Altitudes have this Relation between themſelves, *viz.* that the Firſt exceed the Second, in the ſame *Ratio*, or Proportion, as the Second exceeds the Third. Each of theſe Altitudes may then be uſed, acccording to the Conveniency which they give for Contrivance; that various *Rooms* of ſeveral Dimenſions may be ſo made, as to have all their Arches of an equal Altitude; and be at the ſame Time exactly proportionate: By this Means the Chamber will look agreeable, and be very convenient for the *Floor* above, which will be upon a Level. There are other Proportions for the Altitude of Arches, which do not come under any particular Rules; and are therefore left to the *Architect*, to uſe them as Neceſſity requires.

For our private *Buildings*, here in *London*, the Parliament, after the Conflagration, thought proper to determine the ſeveral Proportions of the Apartments, according to the Bigneſs of the Houſe, *viz.* in Houſes fronting By-ſtreets or Lanes, of two Stories high, beſides Cellars and Garrets; the Cellars ought to be ſix Foot and a half high, if the Spring of Water hinder not; and the firſt Story, nine Foot from the *Floor* to the *Cieling*, and the ſecond Story as much. That in Houſes fronting Streets or Lanes of Note, and the River of *Thames*; which ought to be three Stories high, beſides Cellars and Garrets; the Cellars ſhould be ſix Foot and half high, if the Springs hinder not; the firſt Story, full ten Foot from the *Floor* to the *Cieling*; the Second ten Foot; the Third nine Foot. That in Houſes fronting the high, and principal Streets, which ſhall be of four Stories high, beſides Cellars and Garrets; the firſt Story be full ten Foot in Height, from the *Floor* to the *Cieling*; the Second ten Foot and an half, and the Third nine Foot; the Fourth eight Foot and an half.

In large *Buildings*, and ſumptuous Edifices, the *Rooms* are arched. *Palladio* reckons ſix Kinds of Arches adapted to that Purpoſe, *viz.* croſſed, faſciated, flat, circular, grinded, and Shell-like; all which are in Altitude one third of the Breadth of the *Room*. The four firſt were uſed by the Antients, and the two laſt are of the Invention of the Moderns, who divide Arches, into *Circular*, *Elliptical*, or *Strait*; and ſubdivide the *Circular*, into *Semicircular*, *Scheme*, and *Arches of the third and fourth Point*.

Semicircular-Arches, are thoſe which make an exact *Semicircle*, and have their Center in the Middle of the Chord of the Arch; called alſo by the *French* Builders, *Perfect-Arches*, and Arches *en plaine Cinture*. *Scheme-Arches* are thoſe which are leſs than a *Semicircle*, and conſequently are flatter Arches; containing ſome 90 Degrees, others 70, and others 60: Called alſo *Imperfect-Arches*. *Arches of the third and fourth Point*, conſiſt of two *Arches* of a Circle, meeting in an Angle at the Top, and are drawn from the Diviſion of the Chords, into three or four Parts at Pleaſure. Of this Kind, there are many in old *Gothick Buildings*; but on Account of their Weakneſs and Unſightlineſs, they ought, according to Sir *Henry Wotton*, to be for ever excluded out of all *Buildings*.

Elliptical-Arches conſiſt of a *Semi-Ellipſis*; and were formerly much uſed, inſtead of *Mantle-Trees*, in *Chimneys*. Theſe have commonly a Key-ſtone, and Chaptrels or Impoſts. *Strait-Arches* are thoſe whoſe upper and under Edges are *Strait*; as in the others they are curved; and thoſe two Edges alſo parallel, and the Ends and Joints, all pointing towards a Centre. Theſe are principally uſed over Windows, Doors, *&c.*

Circular-Arches, are made in ſquare Chambers, and, according to *Palladio*, raiſed in this Manner: In the Angles of the *Room*, are left certain *Mutules*, or *Modillions*, which ſuſtain the *Semi-circle* of the Arch; which is flat in the Middle, but more *circular* the nearer it approaches the Angles.

As for the *Cielings* of our *Rooms*, there are different Methods of making them; for ſome People are very curious to have them of beautiful and well wrought *Joiſts*; in which Caſe particular Care muſt be taken, that the Diſtance between the *Joiſts*, be once the Thickneſs and a half of the ſaid *Joiſts*; for that Diſtribution will make the *Cieling* very agreeable, and ſo much of the Wall will be left between the Ends of the *Joiſts*, as will ſuffice to ſupport the Weight over it; but in Caſe they are made at a greater Diſtance, they will look very unhandſome; and if at a leſſer, they will divide as it were the upper Wall from the lower; and if the *Joiſts* ſhould prove rotten, or by any Caſuality be ſet on Fire; the upper Wall muſt fall of courſe. Others are fond of Compartments made of *Stucco-Work*, or of Timber; theſe they fill with Pictures, ſo that they may be variouſly decorated, and therefore no fixed and poſitive Precepts, can be preſcribed upon this Topick. Though thoſe which are to have a Picture in the Middle, are commonly divided into ſquare Pannels in the Corners, and a large Circle in the Middle proper for Painting; the Borders or Margin, being ornamented with *Frets* and *Guilochis*.

Note, That FRET in *Architecture*, is a Kind of Knot, or Ornament; conſiſting of two Liſts, or Fillets, variouſly interlaced, or woven; and running at parallel Diſtances, equal to their Breadth. A neceſſary Condition of theſe *Frets*, is, that every Return, and Interſection, be at right Angles. This is ſo indiſpenſible, that they have no Beauty without it; but become perfectly *Gothick*. Sometimes the *Fret* conſiſts but of a ſingle *Fillet*; which if well managed, may be made to fill its Space exceedingly well. The Antients made great Uſe of theſe *Frets*; the Places they were chiefly applied on, were even, flat Members, or parts of *Buildings*, as the Faces of the Corona, and Eaves of Cornices; under the Roofs, Soffits, *&c.* on the Plinths of Baſes, *&c.* The Appellation was occaſioned hence, that the *French* Word *Frette*, litterally ſignified the Timber-work of a Roof, which conſiſts chiefly of Beams, Rafters, *&c.* laid a-croſs each other and as it were *fretted*. *Frets* and *Guilochis* are ſynonimous. Theſe Ornaments, though ſmall, if they be well adjuſted, are very pleaſing. They are frequently uſed in Picture-frames, Soffits, of Arches, and on Architraves, and ſometimes on *Faſcia's*, and the Plinths of Baſes, if the other Members be carved.

As we have left our *Chimneys* without *Ornaments*, we'll return to them, and have them *decorated*, each with its *Chimney-Piece*; which is a Compoſition of certain

certain Mouldings, of Wood or Stone, ſtanding on the *Foreſide* of the Jambs, and coming over the *Mantle-tree*.

Chimney-Pieces muſt be made *larger*, or *ſmaller*, in Proportion to the *Size* of the *Rooms* where they are intended. As for the various *Ornaments* of *Chimney-Pieces*, they are at the *Diſcretion* of the *Architect*, provided they prove anſwerable to the other *Ornaments* of the *Rooms*.

Our *Floors* are to be of Earth, Bricks, Stones, or Timber. *Palladio* obſerves, that Brick *Pavements* are very *ornamental*, and ſtrike the Eye *agreeably*, as well on account of the Variety of Colours which they borrow from the various Sorts of Earth of which they are compos'd, as from the various Forms which may be given them. He obſerves, further, that the *Floors* of Chambers are but ſeldom made of *natural Stones*, ſince they are too cold in *Winter*; but that they are *agreeable* enough in *Galleries*, and Apartments for publick *Entertainments*.

Carpenters never *floor* their Rooms with Boards till the Carcaſe is ſet up, and alſo inclos'd with Walls, leſt the *Weather* ſhould wrong the *Flooring*; yet they generally rough plane their Boards for the *Flooring*, before they begin any Thing elſe about the *Building*, that they may ſet them by to dry, and ſeaſon; which is done in the moſt careful Manner.

It muſt be obſerv'd, that ſuch Chambers as are upon the ſame *Story*, muſt have their *Pavements level*, and ſo as that the *Threſholds* of the *Doors* may be no higher than the reſt of the Plan of the *Rooms*; and if any little *Room*, or *Cloſet*, ſhould not riſe to that Height, the Remainder muſt be ſupply'd with a *Mezarin*, or *falſe Cieling*.

Leaving the reſt of the Work of the Houſe, which is not properly the *Province* of an *Architect*, to *Plaiſterers*, *Carpenters*, *Joiners*, &c. we'll go from our Houſe in *Town*, into the *Country*, to chuſe, on the *Eſtate* we have lately purchas'd, ſome pleaſing, healthful, and commodious *Situation*, to build a *Country-Houſe*; which muſt be, as near as poſſible, towards the *Center* of our *Eſtate*, that but with a moderate Fatigue we may view the whole, whenever we think proper, (which, conſidering the *Extent* of an *Author's Eſtate*, will not be very difficult) and make *Improvements* round about it; as alſo, that the *Tenants* and *Labourers* may bring the *Growth* of it to our own Houſe with the greater Facility, in which they have been, hitherto, *very negligent*. If the *Houſe* can be *built* near a *River*, it will contribute greatly to its *Beauty* and *Conveniency*; becauſe, by that Means, not only the Product of the Land can be the more eaſily convey'd, at all Times, by *Water*, to the City, and that the *Water* it ſelf will ſerve the Purpoſes of the *Houſe* and *Cattle*; but it will render the Proſpect much more *agreeable*, mightily refreſh the Air in *Summer*, and with great *Advantage*, as well as *Ornament*, *water* the *Fields*, *Gardens*, &c. But in caſe the *Situation* cannot be near a *navigable River*, yet let it be near ſome *Brook*, or other *running Water*, and as diſtant as conveniently can be from *dead* and *ſtagnant Waters*; becauſe theſe are environ'd with a turbid, thick, and heavy *Atmoſphere*, which renders the Place *unhealthy*; which can be eaſily avoided in *elevated* and *agreeable Places*, where the Air, being free, is in a *perpetual Motion*; and the Earth, through its Declivity, purg'd from all *Damps*, and *noxious Vapours*.

It is not adviſeable to *build* in *Valleys* inclos'd by *Mountains*; becauſe *Houſes* will lie conceal'd in ſuch Places, beſides the Diſadvantage of their having no diſtant *Proſpects*, and not being conſpicuous to the Eyes of others; by which means, all their *Beauty* is loſt, beſides their being, in all Reſpects, prejudicial to *Health*. Being then determin'd to *build* upon an *Eminence*, we'll chuſe ſuch a *Situation* as is expos'd to the moſt *temperate Region* of the Air, and is neither always *over ſhadow'd* by higher Hills, nor *ſcorch'd*, as it were, with two Suns, by the Reflection of the real one from ſome adjacent Rock; for in either of theſe Caſes it becomes an *incommodious Habitation*. But if we cannot avoid *building* on *low Ground*, we muſt ſet the firſt *Floor* above the *Ground* the higher, to ſupply what we want to ſink in our *Cellar* in the Ground; for in ſuch *low*, and *moiſt Grounds*, it conduces much to the *Dryneſs* and *Healthineſs* of the Air, to have *Cellars* under the *Houſe*, ſo that the *Floors* be good, and ciel'd underneath. *Houſes* built *too high*, in Places obvious to the Winds, and not well *defended* by *Hills*, or *Trees*, require more Materials to build them, and alſo more Reparations to maintain them; and are not ſo *commodious* to the Inhabitants as thoſe which have thoſe *Advantages*.

As for the Diſtribution of the Apartments, in *Country Houſes*, 'tis made in the ſame Manner as in *City Houſes*, *i. e.* according to the Quality of the *Maſter*, the numerous Companies he is to *entertain*, and the Number of his *Servants*. On both Sides of the *Court* (the *Houſe* being in the *Front*) may be *built*, the *Stables*, *Cellars*, *Granaries*, and ſuch other *commodious Places*, for the *Service* of the *Houſe*.

Palladio gives us the Deſcription of a *Seat* which himſelf calls *beautiful*, erected by *Marco Zeno*, at *Caſalto*, in the *Trivigian*; which I propoſe as a *Model* to my *Readers*. It ſtands upon a *Baſement*, which ſurrounds the whole *Edifice*, equal with the *Floors* of the *Rooms*, which are all arch'd. The Arches of the *ſquare Rooms* are grinded in the Angles about the *Windows*; thoſe of the *Cloſets*, or *Rooms* near the *Galleries*, as well as thoſe of the *Hall*, are *faſciated*. The *Hall* and *Galleries* are arch'd of an equal Altitude, and are likewiſe, both of them, higher than the *Rooms*. The ſame celebrated *Architect* gives us, likewiſe, this other *Deſcription* of another *Villa*, or *Seat*, ſituate at *Bagnolo* in the *Vicentine*, and which I would take for the *Model* of mine. On both Sides of the *Court* are the *Stables*, *Cellars*, *Granaries*, &c. the Columns of the *Portico's* are of the *Dorick* Order, (tho' I would have mine of the *Corinthian*, as more *magnificent*, and not appearing ſo heavy) the *Floor* of the firſt *Chamber* is rais'd ſeven Foot above the Ground, under which is the *Kitchen*, and other Places which belong to the Servants. The *Hall* is *arch'd*, its Altitude being equal to its Breadth, and one Half more, the *Arches* of the *Galleries* have alſo the ſame Proportion. The *Chambers* are ciel'd, and as *high* as they are *broad*; the largeſt are a Square, and two Thirds long; the others are but a Square and a Half.

The principal Care of the *Architect*, in this *Edifice*, which is but of one *Story*, was to have the Stairs which lead to it very commodiouſly plac'd; as for the Back-Stairs, and thoſe which ſerve only for the Offices underneath, or for the Granaries, and other ſuch Places above, they are not ſo carefully adapted for the Reception of a clearer Light; as being not reckon'd among the principal Stories; for if they were, Care ſhould alſo be taken to manage them ſo as to be very *lightſome*, and in convenient Places.

An *Architect* is often ſo much confin'd by the Difficulty, and Irregularity of the *Situation*, that he has not free *Room* to *build* with that *Regularity* and *Elegance* he could wiſh, and is forc'd to deviate from the common Rules, and form to himſelf new ones, to render his *Edifice commodious* and *agreeable*, notwithſtanding the Scantineſs of the Ground, and the Irregularity of the *Situation*. *Palladio*, who was not a Stranger to thoſe Sort of Difficulties, preſents us with ſome Deſigns of his own *Invention*, which can be a very great Help to *Architects*, on ſuch Occaſions.

The firſt is of a *Building* in the Form of a *Pyramid*; the Baſis thereof makes the principal *Front* of the *Houſe*, which has three Orders of Pillars, *Dorick*, *Ionick*, and *Corinthian*. The *Veſtibule* is ſquare, and the *Arch* thereof, whoſe *Height* and *Breadth* is equal, is ſupported by four Pillars; on each Side are two *Chambers*, the *Length* whereof is a Square and two Thirds; each of them has a *Cloſet*, and a ſmall *Stair-Caſe*, to go up to the *Mezaninos*. He places two *Chambers*, a Square and a Half long, at the End of the Entry, with two *Cloſets*, contiguous to them, of the

the ſame Proportion, with their *Stairs* to the *Mezaninos*. He contrives a *Hall* a Square and two Thirds long, with Columns equal to thoſe of the *Veſtibule*. Near to this is a *Gallery*, on both Sides whereof he places two *Out-Stairs*, and at ſome Diſtance a *Yard*, in one Side of which is the *Kitchen*. The *Chambers* in the ſecond *Story* are to be twenty Foot *high*, and thoſe in the third eighteen; each of the *Halls* to be as *high* as the *Roof*, and level with the *Chambers* of the ſecond *Story*; the *Halls* with ſome *Balconies*, or *Corridors*, for the Accommodation of the Company, at publick *Feaſts*, or *Entertainments*.

The ſecond is for a *Houſe* in *Venice*, the principal *Front* whereof has three Orders of Pillars, the *Ionick*, the *Corinthian*, and the *Compoſite*. The *Veſtibule* projects a little outwatds, and is adorn'd with four Pillars, equal to, and like thoſe of the *Front*. The *Chambers*, which are on the Wings, are *arch'd*, after his firſt Manner: Beſides theſe, there are other ſmaller *Chambers*, and *Cloſets*, with *Stairs* to go up to the *Mezaninos*: At the End of the Entry there is a Paſſage into a ſecond *Hall*, which has a little *Court* on one Side, by which it receives its *Light*; and the principal *Stair-Caſe*, on an elliptical Form on the other, and open in the Middle, with Pillars all round, that ſupport the *Steps*. At ſome Diſtance there is another Paſſage for an Entrance into a *Gallery*, the Pillars whereof are *Ionick*, and equal to thoſe of the *Veſtibule*. There is an Apartment, like thoſe at the Entry, on each Side of this *Gallery*, but that Apartment which is on the left Hand is in a Place which contracts it a little more. There is likewiſe a *Court* hard by, adorn'd quite round with Pillars, forming a *Corridor*, which ſerves for the Apartment of the Women, in which they *cook*, and which, for that Reaſon, ought to be backwards. The upper Part is like the lower one, the *Hall* excepted, which is above the Entry, has no Pillars, and is rais'd to the *Roof*, having a *Corridor* that is level to the *Chambers* in the third *Story*; and might, likewiſe, ſerve the upper Windows, this *Hall* having two Rows of them. The *Floor* of the leſſer *Hall* is of the ſame Height with the *Arches* of the ſecond *Chambers*, thoſe being 23 Foot *high*. The Doors and Windows directly perpendicular over one another, and the Wall bearing its Proportion of the *Weight*. The *Cellars*, *Laundries*, and other *Offices*, to be under Ground.

The ſame celebrated *Architect* has ſeveral other *Draughts* of the ſame Kind, which, for Brevity Sake, I forbear mentioning, theſe two being ſufficient to give an *Inſight* into thoſe Sorts of *Buildings* wherein an *Architect* is confin'd to the *Situation*, and wants *Room* for a *regular Edifice*.

As the *building* of *Houſes*, and Places to ſhelter Mankind againſt the Injuries of the Seaſons, and the Inclemency of the Air, is of a far greater Antiquity than the *building* of *Temples*, and *Churches*, ſince in the World's Infancy, and a long while afterwards, and even now, among ſeveral *eaſtern* and *weſtern* Nations, the Divinity is ador'd in open Fields, and the religious Worſhip is not confin'd within the narrow Limits of ſcanty Walls, ſince our *new Apoſtles* ſeem inclinable to revive that antient Manner of *religious Worſhip*; it cannot appear ſurprizing, that we have taken Care to lodge our ſelves, and *build* our own *Houſes*, before thoſe which among us *Chriſtians* are conſecrated to the Service of the *true God*; of which, notwithſtanding, we are a going to give the ſeveral *Dimenſions*.

Thoſe Sort of *Edifices* have alternately been call'd *Temples*, or *Churches*, but moſt commonly *Churches*, among us *Chriſtians*.

A CHURCH is defin'd, by *Daviler*, a large *oblong Edifice*, in Form of a *Ship*, with *Nave*, *Choir*, *Iſles*, *Chappels*, *Belfries*, &c.

Palladio is of Opinion, that the moſt agreeable, and moſt regular Forms a *Church* can be made in, are the round, and the triangular; and, again, of theſe two he chuſes the round Form as the moſt perfect, for the following Reaſons: 1. Becauſe, ſays he, the round Form alone, among all Figures, is ſimple, uniform, equal, ſtrong, and moſt capacious; and therefore can contain a greater Multitude of People. 2. That its being included in a Circle, wherein neither End nor Beginning can be found; having all its Parts alike, and each of them partaking of the Figure of the *whole*, and the Extream in every Part being equally diſtant from the *Center*; it is therefore the moſt proper Figure to denote the Unity, Eſſence, Uniformity and Juſtice of *God*.

Churches, according to the ſame *Author*, ſhould have large *Portico's*, with greater *Columns* than are requiſite in common *Buildings*. The Orders of the *Columns* ſhould be as beautiful as poſſible, and each Order ought to have its own proper and convenient Decoration. *Churches* ſhould alſo be made of the choiceſt, and moſt valuable Materials, that the Divinity may be *honour'd* with the Forms, Decorations, and Materials, as much as poſſible. White, of all Colours, continues *Palladio*, is the moſt ſuitable to *Temples*; becauſe the Purity of it, expreſs'd in the Purity of Life, is *highly acceptable* to the *Almighty*. But in caſe they muſt be painted, there ought to be no Pictures in them that may, in the leaſt, tend to the Alienation of Man's Mind from the Contemplation of the Divinity.

Theſe are *Palladio*'s general Obſervations on the Structure of *Temples*, from which he enters into Particulars, with regard to the Compartments of *Churches*, conſidering that it is abſolutely neceſſary that all their Parts ſhould correſpond together, and have ſuch a Proportion, that there be none of them by which the whole may not be meaſur'd, as well as every individual Part. But, however, as he ſuppoſes the round and quadrangular Forms the two moſt regular, he confines himſelf to give us the neceſſary Directions and Rules follow'd by the Antients in the *building* of thoſe two Kinds of *Temples*.

The Diameter of the whole Space which the *Temple* was to take up, is divided into three equal Parts; one whereof is given to the Steps, that is, the Aſcent of the *Floor*; and two remain'd for the *Temple* it ſelf, and the Columns, which are plac'd upon Pedeſtals, and with their Baſes and Capitals, are as *high* as the Diameter of the leaſt Courſe of the Steps, and a tenth Part as *thick* as they are *high*. The Architraves, Freezes, and other Decorations, are made according to the Rules given in our Treatiſe of *Architecture*.

But ſuch *Temples* as are made with a *Nave*, are either wing'd round, or made with a *Portico* only in the Front. The Compartments of ſuch as are wing'd round, are as follows:

Two Courſes of Steps are made quite round, and the Pedeſtals are ſet upon them, and upon theſe the Columns. The Wings are a fifth Part of the Diameter of the *Temple*, taking the Diameter from the inner Part of the Pedeſtals. The Columns are as long as the Cell is large, being a tenth Part as thick as they are long. The *Cupola* is to be rais'd above the Architrave, Freeze, and Cornice of the Wings, proportionable to the Half of the whole Work. The Columns, which begin from the Floor, and conſequently are without Pedeſtals, render the *Temple* more pompous and majeſtick; Pedeſtals, beſides, obſtructing the going into the *Temple*. If a *Portico* be erected in the Front only of a round *Temple*, it muſt be made as long as the *Nave* is large, or an *eighth Part* leſs; and tho' it may be made ſhorter, yet it muſt, however, never be ſhorter than *three Quarters* of the *Breadth* of the *Church*; nor muſt it ever be made broader than a *third Part* of its *Length*.

In quadrangular *Temples*, the *Portico's* in the Front are to be made as long as the *Temple* is broad, and if the Manner be *Euſtylos*, (*i. e.* whoſe Columns have proper and convenient Intervals) which is the moſt elegant and beautiful, the Compartments muſt be made in this Manner: If the Proſpect be of four Columns, the whole Front of the *Temple* (omitting the Projecture of the Baſes of the Columns in the Corners) muſt be divided into eleven Parts and a Half; one

whereof might be call'd a *Module*, or the Standard whereby the other Parts are to be meaſur'd; four whereof are to be given to the Columns, if they be one *Module* thick; three to the middle Intercolumnation; and four and a Half to the other two; that is, two and a Quarter to each. But in caſe the Front has ſix Columns, it muſt be then divided into eighteen Parts; if eight, into twenty-four and a Half; and if ten, into thirty-one; giving always one of theſe Parts to the Thickneſs of the Columns, three to the middle Void, and two and a Half to each of the other. The Height of the Columns muſt be manag'd according as they are either *Ionick* or *Corinthian*.

The *Ante-Temple* was beyond the *Portico*, and the *Nave* after the former. The Breadth was divided into four Parts, and the Length of the *Temple* conſiſted of eight ſuch; five whereof were given to the Length of the *Nave*, including the Wall wherein the Door is; and the other three remain'd to the *Ante-Temple*, which has two Wings of Walls on its Side, continu'd to the Wall of the Cell. At the End of theſe are made two *Ante's*, that is, two Pilaſters as *thick* as the Columns of the *Portico's*; and ſince between theſe Wings there may be a greater or leſs Space, if the larger be twenty Foot, there ought to be two Columns put between the ſaid Pilaſters, nay, more, if there ſhould be Occaſion, directly oppoſite to the Columns of the *Portico*. The Uſe of them is to ſeparate the *Ante-Temple* from the *Portico*; and the three, or more Voids, that will be between the Pilaſters, muſt be clos'd with Pannels of Wood, or Marble; the neceſſary Opening, however, muſt be left for entering into the *Ante-Temple*. But if the *Breadth* exceeds forty Foot, there muſt be other Columns plac'd within, over-againſt thoſe between the Pilaſters; and they muſt be made as *high* as thoſe without, tho' not quite ſo *thick*; for the open Air will take away from the *Thickneſs* of thoſe without, and the Incloſure will not let the Smalneſs of thoſe within be ſeen, ſo that they will appear equal.

Thus the Antients (according to *Vitruvius*) order'd the Compartments of their *Temples*, which had always *Portico's* to them, to ſhelter the People, who waited for the Hour of the Sacrifice, againſt the Injuries of the *Weather*. But we *Chriſtians*, not regarding whether the *Portico* ſurrounds the *Temple*, or not, *build* our *Churches* much like the antient *Baſilica's*, or Court of Juſtice, with *Portico's* within; the Reaſon whereof is, (as I have obſerv'd in my Treatiſe of *Architecture*) that the firſt who embrac'd the *Chriſtian* Religion us'd to meet for Fear of the *Gentiles*, in the *Baſilica's* of private Perſons; and obſerving, afterwards, that this Form was very convenient, becauſe the Altar could be plac'd in the Room of the Tribunal to great Advantage, and that the Choir could ſtand round the Altar in good Order, while the remaining Part might hold the People, they have not thought proper to alter it ſince.

Some *Authors* pretend, that the *Choir*, in the *Chriſtian Churches*, was not ſeparated from the *Nave* till the Time of *Conſtantine*; that from that Time the *Choir* was rail'd in with a Balluſtrade, with Curtains drawn over, not to be open'd till after the Conſecration. That in the 12th Century they began to incloſe the *Choir* with Walls, but the antient Balluſtrades have been ſince reſtor'd, out of a View to the Beauty of *Architecture*. In Nunneries, the *Choir* is a large Hall, adjoining to the Body of the *Church*, ſeparated by a Grate, where the Religious ſign the Office.

Moſt of the Chriſtian Churches have been made, for a conſiderable Number of Centuries, in the Form of a Croſs; becauſe in that Form they repreſent to Paſſengers, that Wood on which our Bleſſed Saviour was crucified. In that Part which makes the Foot of the Croſs, is the Entrance over-againſt the great Altar, and the Choir; and in the two Iſles extending like Arms on each Sides, are two other Entrances, or two Altars. *Palladio*, though not a very great Admirer of Churches, in the Form of a Croſs, has, notwithſtanding, built that of St. *George*, at *Venice*, in that Form.

There are Churches in a *Greek-Croſs*; and others in a *Latin-Croſs*. Churches in a *Greek-Croſs*, are thoſe where the Length of the Tranſverſe part, is equal to that of the Nave; ſo called, becauſe moſt of the great Churches are built in this Form. Churches in a *Latin-Croſs*, are thoſe whoſe Nave are longer than the *Croſs* Part, as moſt of our antient Churches.

There are alſo Churches in *Rotundo*, which are thoſe, whoſe Plan is a perfect Circle; and which in *Palladio's* Opinion, are the more beautiful, commodious, and regular. In all theſe different Sorts of Churches; the Dimenſions, with Reſpect to their Breadth, Length, the Heighth, and Bigneſs of the Pillars; their different Orders, *&c.* ſhould be obſerved as above preſcribed; avoiding as much as poſſible, their having too great a Number of monſtrous Columns in the Nave; which is a choaking Imperfection, in our Church of St. *Paul's* in *London*.

The Form of the antient *Greek* Churches, when they had all their Parts, was as follows: Firſt was a Porch, or Portico, called the *Vaunt-Nave*, προναος, adorned with Columns on the Outſide, and on the Inſide ſurrounded with a Wall; in the Middle whereof was a Door, through which they paſſed into a ſecond Portico. The Firſt of theſe Portico's was deſigned for the *Energumeni*, and Penitents in the firſt Stage of their Repentance. The Second was much longer, deſigned for Penitents of the ſecond Claſs, and the *Catechumens*; and hence called ναρθηξ, *Ferula*, becauſe thoſe placed in it, began to be ſubject to the Diſcipline of the Church: Theſe two Portico's took up about one third of the Space of the Church. From the ſecond Portico, they paſſed into the *Nave*, ναος, which took up near another third of the Church. In the middle, or at one Side of the *Nave*, was the *Ambo*; where the Deacons, and Prieſts, read the Goſpel, and preached. The *Nave* was deſigned for the Reception of the People, who here aſſiſted at the *Liturgy*. Near the Entrance of this, was the Baptiſtery, or Font. Beyond the *Nave* was the Choir χορος, ſet with Seats, and round; the firſt Seat, on the Right, next the Sanctuary, being for the *Chantor*, or *Choragus*. From the Choir, they aſcended by Steps to the Sanctuary; which was entered at three Doors. The Sanctuary had three Apſides in its Length; a great one in the Middle; under which was the Altar, covered with a Baldachin ſupported by four Columns. Under each of the ſmall Apſides, was a Kind of Table, or Cupboard, in Manner of a Buffet; at this preſent Time, in the *Roman* Catholick Churches, called *Tabernaculum*, Tabernacle.

Note, That AMBO, or *Ambon*, was a Kind of Pulpit, or Deſk, in the antient Churches, and is yet ſo in the *Roman* Catholick; aſcended to, by ſeveral Steps, where the Subdeacon reads, or ſings the Epiſtles, and the Deacon the Goſpel; with this Difference, that the Goſpel is read at the Top of the *Ambo*, and the Epiſtle, a Step lower. Some Authors take the *Apſis*, to have been that part of the Church, wherein the Clergy ſate, and the Altar was placed; that it was of an hemiſpherical Figure, and conſiſted of two Parts, the Choir, and the Sanctuary. That the former had Seats, or Stalls placed around it; wherein the Eccleſiaſticks were diſpoſed. That in the Middle or fartheſt Part, was the Biſhop's Throne; and that the Sanctuary was the oppoſite End, next the *Nave*; from which it was ſeparated by a Grate. Others pretend that the *Apſis*, is more particularly uſed for the Biſhops-Seat, or Throne, in antient Churches: This was moſt particularly called *Apſis Gradata*, becauſe raiſed on Steps above the ordinary Stalls. *Baldachin*, was a Piece of *Architecture*, in form of a Canopy, ſupported with Columns, and ſerving as a Crown or Covering to the Altar.

There is a Place added to our *Churches*, which is ſeparated

ſeparated from the reſt, called the *Sacriſty*, or *Veſtry*; where the Veſtments belonging to the Prieſts, are depoſited; as alſo the Veſſels, the Sacred Books, and ſuch other Things, as are made uſe of in divine Service; the Prieſts likewiſe, dreſſing themſelves there. *Towers* and *Steeples* are alſo raiſed; wherein Bells are hung, to ſummon People to their publick Devotions; or in *England*, to divert a Set of idle Fellows.

Palladio gives us the Deſcription of a *Church*, called *the Baptiſm of Conſtantine*, and which is at *St. John de Lateran*, at *Rome*; which he ſuppoſes to have been built of the Spoils, and Ruins of antient Fabricks: As learned Authors believe the Deſign beautiful, and the Decorations very well carved; I'll inſert it here, for the Benefit of *Architects*, who have not *Palladio*'s Works. The Columns are of *Porphyry*, and of the *Compoſite* Order: The Baſe is a Compound of the *Attick*, and *Ionick*, but inſtead of two Aſtragals, which are made between the Scotias in the *Ionick*; this has one only, which takes up the Room of two: All theſe Members are beautifully carved, and have fine Intaglias. The Baſes of the Columns, in the Portico, are embelliſh'd with Leaves, running up along the Shaft of the Column; and though the Shaft of the Columns, are not ſo long as they ſhould be, yet by this Management the Work is not robbed in the leaſt, of its Beauty and Majeſty. The Capitals are compounded of *Ionick* and *Corinthian*, with *Acanthus* Leaves. The Architrave is very well carved, its Cimaſe having a Fuſarole, and above half an Ovolo; inſtead of a Gula-inverſa, the Freeze is plain. The Cornice has two Gula-rectas, one above the other, which is a Thing which very ſeldom happens: Since two Members of the very ſame Sort, ſhould be put over each other, without ſome other intermediate Member beſides the Liſtel. Over theſe Gula-rectas or Cimatiums, is a Dentil, and then the Corona with its Ogee, and laſt of all a Gula-recta, or another Cimaſe; ſo that the *Architect* in this Cornice, has, by making Dentils, avoided Modillions.

Vitruvius had diſtinguiſhed *Temples*, with regard to their Conſtruction, into various Kinds; as, *Temple in Antæ*, *ædes in Antis*, which were the moſt ſimple of all *Temples*; having only angular Pilaſters, called *Antæ*, or *Paraſtatæ*, at the Corners; and two *Tuſcan* Columns on each Side the Doors. *Tetraſtyle*, which was a *Temple* which had four Columns in Front, and as many behind. *Proſtyle*, which had only Columns on its Front, or Fore-ſide. *Amphiproſtyle*, which had Columns both before and behind; and which was alſo *Tetraſtyle*. *Pireptere*, which had four Rows of inſulated Columns around, and was *Hexaſtyle*; that is, had ſix Columns in Front. *Dioptere*, which had two Wings, and two Rows of Columns around, and was alſo *Octaſtyle*, or had eight Columns in Front.

There were alſo *Pſeudodiptere Temples*, which had eight Columns in Front, and a little Row of Columns all around; by which it was diſtinguiſhed from the *Dioptere*, which had two Rows of Columns all around. *Hypæthros*, which had no Roof, or Covering. *Monopiere*, which was round and without Walls, having its Dome ſupported by Columns.

From the *Building* of *Churches*, we'll paſs to the Erection of *Bridges*, which are Edifices either of Stone or Timber, conſiſting of one or more Arches; erected over a River, Canal, or the like, for the Conveniency of croſſing, or paſſing over from one Side to the other.

Bridges ſhould be always well deſigned, commodious, durable, and well decorated. The Peers of Stone are to be equal in Number, that there may be one Arch in the Middle, where commonly the Current is ſtrongeſt. Their Thickneſs not to be leſs than a ſixth Part of the Span of the Arch, nor more than a Fourth. They are commonly guarded in Front with an angular Starling, or Spur, to break the Force of the Current; though this Defence is ſometimes alſo turned *ſemicircularly*; in the antient *Bridges*, it is always a right Angle; which has the Advantage of being ſtronger, and more durable than acute ones. The ſtrongeſt Arches are thoſe whoſe Sweep is a whole *Semicircle*.

The Breadth of a *Bridge* according to *Baptiſta Alberti*, ought to be the ſame as that of the High-way which abuts on it: The Breadth of the Peers is to be one third of the Apertures of the Arches; the Starling to be one half the Breadth of the Peers, and to riſe above the greateſt Height, to which the Water ever mounts.

Palladio ſays, that four Things are to be conſidered in the Erection of *Stone-Bridges*, viz. the Heads which are made at the Banks; the Piles, or Pilaſters, which are fixed in the River; the Arches which theſe Pilaſters ſupport; and the Pavement which is made over the Arches.

He obſerves, that the Heads of theſe *Bridges*, ſhould be made as firm and ſubſtantial as poſſibly can be; becauſe they not only ſerve to ſupport the Weight of the Arches as the other Pilaſters do, but they likewiſe keep the whole *Bridge* together, and the Arches from cracking or opening. That they are made, therefore, where the Banks are of Stone, or at leaſt of ſolid Earth; and that no Bank of Earth being naturally ſolid enough for this Occaſion, Art muſt be uſed to make them firm and ſtrong, and other Arches and Buttreſſes muſt be added; that if the Water ſhould happen to deſtroy the Bank, yet the Way to the *Bridge* might ſtill be preſerved. That the Pilaſters which are to be made in Proportion to the Largeneſs of the River, ſhould always be even in regard to their Number; not only the better to ſupport the Weight, but that they ſhould likewiſe ſtrike the Eye agreeably, and render the Work more ſubſtantial, ſince the Current of the River in the Middle (where it is naturally more rapid, as being more diſtant from the Banks) is thus free, and does not prejudice the Pilaſters by perpetually ſhaking them. For this Reaſon the Pilaſters ought to be ſo comparted, as to fall in that Part of the River where the Courſe is leaſt rapid. That the Foundation of *Bridges* ought to be made at that Time of the Year when the Waters are loweſt, which is in *Autumn*; and in Caſe the Bottom of the River be of Stone or Gravel-ſtone, or any ſoft Stone whatſoever, which is a Kind of Earth which is partly Stone; the Foundations are already made without any Trouble of digging, becauſe theſe are naturally the beſt Foundations; but in Caſe the Bottom of the River be of Sand or Gravel, it muſt be digged therein till the Workman come to the ſolid Ground; or if that ſhould prove too laborious or impracticable, he muſt dig moderately deep in the Sand or Gravel, and then drive in Oaken Piles, which will reach the ſolid and firm Ground, with the Iron by which their Points are to be armed. That to lay the Foundation of the Pilaſters, only one Part of the Bed of the River muſt be encloſed from the Water, and then build there, that the other Part being left open, the Water may have its free Current; and ſo to go on from Part to Part. That the Pilaſters muſt not be leſs in Dimenſion, than the ſixth Part of the Breadth of the Arch; nor generally ſpeaking larger than a fourth. That they ſhould be made of great Stones joined together with Cramps, and Bars of Iron, faſtened with Lead, that they may be as it were, all of one Piece by ſuch Ligaments. That the Fronts of the Pilaſters, or that Side which faces the Stream, ſhould be made angular; that is, ending in a right Angle; and ſometimes, they are made circular (as we have already obſerved) in order to divide or break the Water; and that thoſe Things which are impetuouſly brought down the River, when they ſtrike againſt them, may be ſhoved from the Pilaſters, and paſs through the Middle of the Arch. That the Arches too, ſhould be made very ſtrong and ſubſtantial, and with great Stones, well united together, the better to reſiſt the conſtant paſſing of Carriages, or any other Weight that ſhall happen to come over them; which Arches are the ſtrongeſt, when they conſiſt of a Semicircle, becauſe they entirely reſt upon the Pilaſters, and never preſs upon each other: But, that if by the Nature of the Situa-

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tion and Diſpoſition of the Pilaſters, a perfect Semicircle ſhould not be commodious, as rendering the Aſcent and Deſcent difficult, a leſſer Section muſt be then made uſe of, and ſuch Arches ſhould be made as riſe only the third Part of the Diameter; and in this Caſe, the Foundations muſt be made extreamly ſtrong upon the Banks. Laſtly, that the Pavement of theſe *Bridges*, ought to be made exactly like thoſe of Ways and Streets. Theſe are *Palladio*'s Inſtructions and Rules, for the Erection of *Bridges*.

Notwithſtanding all theſe Rules given by *Palladio*, and other eminent *Architects*, as *Alberti*, *Scammozzi*, *Goldman*, *Hawkſmoor*, and *Gautier*, who has a Piece expreſs on *Bridges*, antient and modern, *viz. Traité des Ponts*, *Paris*, 1716, 12*mo*. Complaints are ſtill made, that no demonſtrative Reaſons are given, of the ſeveral Proportions of the moſt eſſential Parts of *Bridges*; much of which is ſtill left to the Diſcretion of the *Builder*, to be regulated according to the Circumſtances, Deſign, Place, Magnitude, *&c.* of the deſign'd Edifice. M. *Gautier* wiſhes that ſome Mathematicians would take the Structure and Proportions of *Bridges* into their Conſideration, in order to bring the Thing to more Certainty, and Preciſion, founded on invariable geometrical Truth. Something of which Kind has been attempted by M. *De la Hire*, in the *Memoirs* of the *Royal Academy of Sciences*, *Anno* 1712, p. 70. and the Marquis *De l'Hôpital*, in *Act. Erud. Lipſ.* 1695, p. 56.

In Fact, there are few *Bridges*, eſpecially thoſe of any Note, which do not differ in their Proportions and Dimenſions, and which have not ſomething remarkable and particular, by which they are diſtinguiſhable from each other. For Example, the famous *Bridge* at *Venice*, call'd the *Rialto*, conſiſts but of a ſingle flat, or low *Arch*, whoſe Spawn is 98 Feet and a Half, and its Height above the Water only 23 Feet. Thoſe of St. *Eſprit*, *Avignon*, and *Lyons*, are not ſtreight, eſpecially the two former, but bent, having an Angle whoſe Convexity is turn'd towards the Stream, to break the Force thereof. Dr. *Robinſon* obſerves, that the *Pont St. Eſprit* is bow'd in many Places, making unequal Angles, eſpecially in thoſe Parts where the Stream is ſtrongeſt. This *Bridge* is built over the *Rhone*, which is a very rapid River.

The Current of a River is ſometimes diminiſh'd, to ſecure the Piers of the *Bridge* which are *building* over it; which is done either by lengthening its Courſe, by making it more winding, or by ſtopping its Bottom with Rows of Banks, Stakes, or Piles, which break the Current. The Piers always diminiſh the Current of a River: Suppoſe this Diminution one fifth Part, it will follow, that in caſe of Inundations, the Bed muſt be ſunk, or hollow'd one fifth Part more than before, ſince the Waters gain in *Depth* what they have loſt in *Breadth*. Add, as the Quantity of the Water remains ſtill the ſame, it will paſs with greater Velocity, by one fifth Part, in the Place where ſuch Contraction is; all which conduces to waſh away the Foundation. The Stream thus augmented in Velocity, will carry away Flints and Stones, which, before, it could not ſtir.

Palladio gives us the *Draught* of a *Bridge* of his own Invention, which was to be *built* over a very rapid River, one hundred and eighty Feet broad. The whole *Breadth* of the *Bridge* is divided into three *Arches*, that of the Middle to be ſixty Feet *broad*, and the other two forty-eight each. The Pillars for the Support of the *Arches* were twelve Feet *thick*, being, thereby, a fifth Part of the middle *Arch*, and a fourth Part of the leſſer ones; which tho' deviating from the common Meaſures of *Pilaſters*, were made ſo *thick* on purpoſe that they might project very far from the Body of the *Bridge*, in order to reſiſt the Rapidity of the Current, and oppoſe the Stones and Trees which fall down with the Stream. The *Arches* were to have been a Portion of a Circle leſs than a Semicircle, that the *Aſcent* and *Deſcent* of the *Bridge* might be plain and eaſy. The *Archivolte* of the *Arches* to have been made a *17th* Part of the Void of the middle *Arch*, and a *14th* Part of the other two. Over the *Pilaſters* were to have been *Niches*, and *Statues*, and a *Cornice*, on both Sides, the *whole Length* of the *Bridge*.

Bridges are alſo often made of Wood, and conſiſt of Beams and Joiſts ſuſtain'd by Punchions, well cramp'd, and bound together. The *Latins* call'd this Sort of *Bridges*, *Pontes Sublicii*; on the Structure whereof, *Sturmius* has an expreſs Diſſertation.

Palladio pretends, that the Particulars for the Erection of *wooden Bridges* being innumerable, no certain or determinate Rules can be given about them; but, however, he preſents us with ſome *Draughts* of ſeveral *Bridges* of that Kind, and by particularizing their ſeveral Proportions, believes, that an *Architect* who has the leaſt Genius, can hence take its Meaſures for the Erection of *wooden Bridges*. Among his ſeveral *Draughts*, he propoſes that of the *wooden Bridge* built over the *Ciſmone*, a River which falls from the Mountains that divide *Italy* from *Germany*, and enters into the *Buenta* a little above *Baſſano*, as the moſt ſubſtantial, beautiful, and commodious. The River over which this *Bridge* ſtands, is a hundred Foot broad, which *Breadth* is divided into ſix equal Parts, and at the End of each Part (except at the Banks, which are ſtrengthen'd with two ſolid Butments of Stone) are plac'd the Beams which conſtitute the Bed, and *Breadth* of the *Bridge*. Over theſe, directly with the firſt, are plac'd the *Colonelli*, or little Pillars, on each Side; theſe Pillars are faſten'd to the Beams, (which make the *Breadth* of the *Bridge*) with iron Cramps, contriv'd to paſs thro' a Hole, made for that Purpoſe, in the Heads of the ſaid Beams, in that Part which advances beyond thoſe Pieces which conſtitute the Sides. Theſe Cramps being in the upper Part, along the ſaid ſtrait and plain Pillars, perforated in divers Places, and in the under Part, near to thoſe thick Beams beforemention'd, and with a moderately big Hole, went into the Pillars, and faſten'd again below with little Bars, or Pins of Iron, made for that Purpoſe. Hence the whole Work becomes, as it were, united; ſo that the Beams, which make the *Breadth* of the *Bridge*, and thoſe of the Sides, are, in a Manner, one Piece with the Pillars; which thus come to ſupport the Beams which make the *Breadth*, as theſe are again ſupported by the Arms which extend from one Pillar to the other. Thus all the Parts mutually ſupport each other, and their Diſpoſition is ſuch, that the greater *Weight* there is on the *Bridge*, ſo much the faſter do they cloſe together, and corroborate the Work. All thoſe Arms, and other Pieces of Timber, which make up the Body of the *Bridge*, are but a *Foot* in *Breadth*, and *three Fourths* in *Thickneſs*; but thoſe Pieces which make the Bed of the *Bridge*, that is to ſay, thoſe laid *length-wiſe*, are conſiderably ſmaller.

The ſame learned *Author* aſſures us, that *wooden Bridges* may be made without any Poſts in the Water, in the following Manner: The Banks having been ſtrengthen'd with Butments, as far as it is convenient, one of the Beams which make the *Breadth* of the *Bridge*, muſt be laid at a ſmall Diſtance from them, and then the Beams, which make the Sides, diſpos'd upon it, which, with one of their Heads, are to lay upon the Bank, and to be faſten'd to it; then upon theſe, direct with the Beam laid for the *Breadth*, the *Colonelli*, or Pillars, muſt be plac'd, which are to be faſten'd into the ſaid Beams with iron Cramps, and ſupported by the Braces well fix'd in the Head of the *Bridge*; that is to ſay, in the Beams which make the Sides upon the Bank. Afterwards, leaving as much Space as ſhall be left by the ſaid Beam for the *Breadth* to the Bank, the other Beam muſt be laid for the *Breadth*, which ſhall be, in like manner, faſten'd to the Beams, which are to be laid over it *length-wiſe*, and to the Pillars likewiſe, as they will be ſupported by their Braces. And thus muſt it be done from one End to the other, or as far as it will be requiſite, always obſerving, in ſuch *Bridges*, that in the Middle of the *Breadth* there be a Pillar, the Braces whereof ſhall meet over-againſt one another, and in the upper

Parts other Beams muſt be put, which extending from one Pillar to another, will keep them united, and (together with the Braces plac'd in the Head of the *Bridge*) they will make a Portion of a Circle leſs than a Semicircle. Thus making every Brace ſupport its Pillar, and every Pillar the croſs Beam, and thoſe that make the Sides, every Part ſupports its own *Weight*. Such *Bridges* are large at their Heads, and grow narrow near the Middle of their *Length*. They are called *Pendant*, or *Hanging*, or *Philoſophical Bridges*.

Dr. *Wallis* gives the Deſign of a *Timber Bridge*, ſeventy Foot long, without any Pillars; and Dr. *Plot* aſſures us, that there was formerly a large *Bridge* over the Caſtle Ditch of *Tutbury* in *Staffordſhire*, made of Pieces of Timber, not much above a Yard long, and yet not ſupported underneath, either with Pillars, or *Arch-work*, or any other Sort of Prop whatever.

Note, That BUTMENTS, in this Place, are thoſe Supporters, or Props, on, or againſt which, the Feet of *Arches* reſt. *Cramps*, are Pieces of Iron bent at each Extreme, ſerving to bind together Pieces of Wood, Stones, or other Things. *Brace*, a Piece of Timber fram'd in with Bevel-joints; ſerving to keep the *Building* from ſwerving either Way.

There are, alſo, *Ruſhen-Bridges*, *Ponts de Jonc*, made of large Sheaves of Ruſhes growing in marſhy Grounds; which they cover over with Boards, or Planks. They ſerve for croſſing Ground that is boggy, miry, or rotten.

As for the other Sorts of *Bridges*, as *Draw-Bridges*, *Flying-Bridges*, *Bridges of Boats*, &c. which properly belong to *Fortification*; we'll defer treating of them till we come to our Treatiſe of *Fortification*, under the Letter *F*.

As there is alſo an Art in judging of *Buildings*, as well as in erecting them, Sir *Henry Wotton* has been ſo kind to lay down, for that Purpoſe, the following Rules: That before fixing any Judgment a Perſon ought to be inform'd of its Age, ſince if apparent Decay be found to exceed the Proportion of Time, it may be concluded, without further Inquiſition, either that the Situation is naught, or the Materials, or Workmanſhip, too ſlight. If it be found to bear its Years well, we muſt run back from the Ornaments, and Things which ſtrike the Eye firſt, to the more eſſential Members; till we be able to form a Concluſion that the Work is commodious, firm, and delightful; the three Conditions, in a good *Building*, laid down at firſt, and agreed on by all *Authors*.

Vaſſari propoſes another, *viz.* by paſſing a running Examination over the whole *Edifice*, compar'd to the Structure of a well-made Man; as whether the Walls ſtand upright on a clean Footing and Foundation; whether the *Building* be of a beautiful Stature; whether for the Breadth it appears well burniſh'd; whether the principal Entrance be on the middle Line of the Front, or Face, like our Mouths; the Windows as our Eyes, ſet in equal Number and Diſtance on both Sides; the Offices, like the Veins, uſefully diſtributed, *&c.*

Vitruvius gives a third Method of judging; ſumming up the whole Art under theſe ſix Heads: *Ordination*, or ſetling the Model, and Scale of the Work; *Diſpoſition*, the juſt Expreſſion of the firſt Deſign thereof; (which two, Sir *H. Wotton* thinks he might have ſpar'd, as belonging rather to the *Artificer*, than the *Cenſurer*;) *Eurythmy*, the agreeable Harmony between the *Length*, *Breadth*, and *Height* of the ſeveral *Rooms*, &c. *Symmetry*, or the Agreement between the Parts and the whole; *Decor*, the due Relation between the *Building* and the Inhabitant; whence *Palladio* concludes, the principal Entrance ought never to be limited by any Rule, but the Dignity and Generoſity of the Maſter; and, laſtly, *Diſtribution*, the uſeful caſting of the ſeveral Rooms for Offices, Entertainment, or Pleaſure. Theſe laſt four are ever to be run over, as a Man paſſes any determinate Cenſure; and theſe alone, Sir *Henry* obſerves, are ſufficient to condemn or acquit any *Building* whatever.

Dr. *Fuller* gives us two or three good *Aphoriſms* in *Building*; as, 1. Let not the common Rooms be ſeveral, nor the ſeveral Rooms common; *i. e.* the common Rooms not to be private, or retired, as the *Hall*, *Galleries*, &c. which are to be open; and the *Chambers*, &c. to be retir'd. 2. A Houſe had better be too little for a Day, than too big for a Year; Houſes, therefore, ought to be proportion'd to ordinary Occaſions, not extraordinary. 3. Country Houſes muſt be Subſtantives, able to ſtand of themſelves; not like City *Buildings*, ſupported and ſhelter'd, on each Side, by their Neighbours. 4. Let not the Front look aſquint on a Stranger, but accoſt him right, at his Entrance. 5. Let the Offices keep their due Diſtance from the Manſion-houſe; thoſe are too familiar which are of the ſame Pile with it.

Palladio gives us general Directions for *Building*, ſome of which are, in my Opinion, almoſt impracticable; as this, that a due Regard muſt be had to the Dignity and Diſtinction of the Perſon who *builds*, more than to his Fortune; and his Houſe muſt be made ſuitable to his Rank and Degree; which cannot be done, unleſs the Perſon who *builds* has likewiſe a Fortune agreeable to his Rank, to enable him to defray the Expences of ſuch a *Building*; otherwiſe *Palladio* muſt excuſe a Brother *Architect*, if he be forc'd to deviate from this Rule, by *building* a Palace for a rich Scoundrel, and but too often a Hutt for a Perſon of the moſt illuſtrious Birth, and who could reckon more Heroes among his Anceſtors, than Acres of Land in his Eſtate; which is the Cauſe why we ſo often ſee a Muſhroom, ſprung from a Dunghil, and rear'd up in its Filth, brought into a ſumptuous Palace, where Nature and Art have rivall'd each other; while a Perſon of Merit and Birth is confin'd within the ſcanty Walls of a private and mean Edifice.

The ſame *Palladio* ſays, that the Houſes of Judges, Counſellors, *&c.* ſhould have commodious Places to walk in, and where their Clients may wait, without being reſtleſs and impatient; which, in ſome Reſpect, is alſo almoſt impoſſible; for it is true, that conſidering the immenſe Wealth of a vaſt Number of Gentlemen of that Profeſſion, which in this Country is a Kind of *Peru*, an *Architect* may eaſily *build*, in the Palaces of our Judges, and the magnificent Houſes of ſome of our Counſellors, thoſe Sorts of convenient Places; but I defy him, let them be ever ſo commodious, to make Clients wait there, without being reſtleſs, and impatient. He directs, alſo, that Merchants Houſes ſhould have Warehouſes, and other Apartments, expos'd to the North, wherein their Goods, and other Commodities, may be commodiouſly kept; and that thoſe Places muſt be ſo order'd, that the Maſters may have no Occaſion to apprehend any Danger from the Inſults of Robbers.

BULLS.

BULL, (from the *Latin Bulla*, a Seal; or the *Greek* βουλη, Council) is properly, and moſt commonly, an Inſtrument diſpatch'd out of the *Roman Chancery*, ſeal'd with Lead; anſwering to the Edicts, Letters Patents, and Proviſions of ſecular Princes.

A *Bull* is no otherwiſe diſtinguiſh'd from a Reſcript, or ſimple Signature, but by its being written on Parchment; while a *Reſcript*, or *ſimple Signature*, is only on Paper: Therefore, as the *Bull* is not to take in more Matter than a *Signature*, and only exemplifies and dilates what the *Signature* comprehends in a few Words, it may be properly conſider'd as a *Signature* enlarg'd.

If the *Bulls* be Letters of Grace, the Lead is hung on ſilken Threads; if they be Letters of Juſtice, and executory, the Lead is hung by a hempen Cord. They are all wrote in an old *Roman Gothick* Letter.

The *Bull*, in the Form wherein it is to be diſpatch'd, is divided into five Parts, *viz.* the Narrative of the Fact; the Conception; the Clauſe; the Date; and the Salutation; in which the *Pope* calls himſelf *Servus Servorum Dei*, Servant of the Servants of God. Properly ſpeaking, it is the Seal, or pendant Lead alone, that is the *Bull*, it being that which gives it both the Title, and Authority. The Seal preſents, on one Side, the Heads of St. *Peter*, and St. *Paul*; on the other, the Name of the *Pope*, and the Year of his Pontificate. *Bulls* borrow always their Name from the Words they begin by; as the *Bull in Cœnâ Domini*, the *Bull Unigenitus Dei Filius*, *&c.*

Bulls are diſpatch'd for the Publication of Jubilees, to authorize *Roman Catholick* Princes, to raiſe Taxes on their Clergy, *&c.* to excommunicate them; for the Convocation of general, national, or provincial Councils; to return Thanks, or compliment Princes, or other eminent Perſons, for ſome ſignal Services they have done to the *Church*, (as that of *Leo* X. to *Henry* VIII. King of *England*, to thank him for the Book he had wrote againſt that of *Luther*, of the *Babyloniſh Captivity*, and in which the *Pope* gives to that Prince the Title of DEFENDER OF THE FAITH, which the Kings of *England* have retain'd to this Day) for the Publication of Indulgences, the Condemnation of Books; in *Spain*, for holding any Kinds of Benefices; and in *France*, for Biſhopricks, Abbies, Dignities, and Priories conventual, which are not elective.

According to the Laws of the *Roman Chancery*, no *Benefice*, exceeding twenty-four Ducats *per Annum*, ſhould be conferr'd without *Bulls*; but the *French* would never ſubmit to this Rule, except for ſuch *Benefices* as are tax'd in the Apoſtolical Chamber: For the reſt, they reſerve the Right of diſſembling the Value, expreſſing it in general Terms: *Cujus & illi forſan annexorum fructus* 24 *Ducatorum auri, de Camera, ſecundum communem æſtimationem, valorem annuum non excedunt.*

By the *Concordat*, or Agreement concluded at *Bologna* in 1516, between *Leo* X. and *Francis* I. King of *France*, (*Chambers* ſays *Leo* I. which is a Fault of *Chronology*, with the ſmall Difference of 1066 Years, ſince *Leo* I. ſucceeded *Sixtus* III. in the *See* of *Rome* *Anno* 440.) it was ſtipulated, that the King ſhould have the Nomination of all the Biſhopricks, Abbies, *&c.* of his Kingdom, but that no Biſhops ſhould be conſecrated, Abbots introniz'd, *&c.* before they had obtain'd the *Pope's Bull*, for that Effect; for which they are to pay the *Annates*, or whole Year's *Revenue* of their *Benefice*, as rated in the *Apoſtolical Chamber* at the Time of the *Concordat*; which is not a Quarter of the yearly *Revenue* of thoſe *Benefices*, as it ſtands at preſent. The *Pope* is ſometimes pleas'd to *exempt* the Perſon, nominated to ſuch a *Benefice*, from paying thoſe *Annates*, or to oblige the King, or the Perſon promoted, and always grants his *Bulls gratis*, to thoſe of the regular Clergy promoted to a Biſhoprick, an Abby, Priory, *&c.* on this Conſideration, that they were ordain'd Prieſts *ſub Titulo paupertatis*, and conſequently, having no other *Revenue*, are not in a Condition to advance a Year's Income of their *Benefice*.

Note, That the firſt *Pope* who impos'd *Annates*, in *England*, ſeems to have been *Clement* V. who, according to *Matthew* of *Weſtminſter*, exacted *Annates* of all the vacant *Benefices* in the Kingdom for the Space of two Years; or, according to *Walſingham*, for three Years. His Succeſſor, *John* XXII. introduc'd the like in *France*. Yet *Polydore Virgil*, and ſome others, take *Annates* to be of a much older ſtanding, and to have obtain'd long before they were paid to the *Pope*. 'Tis certain, at leaſt, that from the twelfth Century there were Biſhops and Abbots, who by ſome peculiar Cuſtom, or Privilege, took *Annates* of the *Benefices* depending on their Diocele, or Abby. *Matthew Paris*, in his Hiſtory of *England*, for the Year 746, relates, that the Archbiſhop of *Canterbury*, in Virtue of a Grant, or Conceſſion of a *Pope*, receiv'd *Annates* of all the *Benefices* that became vacant in *England*. But in After-times the *holy See* thought fit to take them away from the Biſhops and Archbiſhops, and appropriate them to themſelves. And from the *Pope*, the Parliament under *Henry* VIII. took them, and gave them to the Crown, 25 *H.* 8. *c.* 20. Queen *Anne* reſtor'd them to the *Church*, by appropriating them to the Augmentation of poor Livings.

M. *Anthony Godeau*, Biſhop of *Vence* in *France*, exclaim'd loudly, in his Eccleſiaſtical Hiſtory, againſt the Extortions of the Court of *Rome* for the granting of *Bulls* for *Benefices*, which, he ſays, exceeds often the *Revenue* of thoſe *Benefices*. Which may be probable enough, that ſome of their Biſhopricks in *France*, were, at the Time they were firſt rated, of a far greater Extent, and conſequently of a far greater *Revenue* than they are at preſent, two Biſhopricks having been made of one, and ſome diſmember'd to increaſe the *Revenue* of others; which the *Apoſtolical Chamber* do not think proper, nor much to its Advantage, to take into Conſideration; believing, on the contrary, that *Meſſieurs* the *French* Biſhops are very well off, conſidering the voracious Appetite of the Court of *Rome*, that ſhe takes no Notice that the *Annates* fall often very ſhort of the *Revenue* of the *Benefice*. Therefore a lean *Benefice* muſt pay for the Indulgence granted to a fat one. But, however, the good Biſhop of *Vence* would be willing enough to ſtile thoſe Exactions for *Bulls*, a *pure*, and *natural Simony*; and pretends, that under what Name ſoever 'tis palliated, 'tis very difficult to waſh off that *dirty Spot*; and that it is a monſtrous, and ſcandalous Diſorder to be complain'd of, but never to be remedied.

According to the Privileges of the *Gallican Church*, no *Bull*, but theſe, can be of any Force in *France*, but on the following Conditions:

1. It muſt have been granted at the Deſire of the King himſelf. 2. After it has been granted, it is ſent, by the King's Orders, to the *Sorbonne*, to be carefully examin'd, in order to diſcover if it contains nothing contrary to the Liberties of the *Gallican Church*, which the Court of *Rome* has often attempted to oppreſs, but in vain; for the Kings of *France* themſelves are as jealous of thoſe Liberties, as they are of the glorious Title, of PRIMOGENITUS ECCLESIÆ, the *Firſt-born of the Church*. 3. It muſt be receiv'd by

by the Majority of the *French* Clergy; which laſt Condition is but a ſimple Ceremony; for the Clergy there (I mean the ſuperior Clergy) are ſo much influenc'd by the Court, that it ſuffices the King to aſk for a *Bull*, for it to be receiv'd by almoſt the unanimous Conſent of the Clergy, who are always of the Prince's Religion, becauſe acting otherwiſe, would prove prejudicial to their private Intereſt. 4. No Money is granted for the Impetration of ſuch *Bulls*.

That all theſe Conditions are requiſite for the Validity of a *Pope*'s *Bull* in *France*, is evident, from what has happen'd in our Days, in the Affair of the famous *Bull* UNIGENITUS, for the Condemnation of the *French* Verſion of the *New Teſtament* by *Queſnel*, F. of the *Oratory*; and as this Affair has been carried to a very great Height by the two contending Parties, and is not yet happily terminated, it will not be improper to entertain my Readers, in this Place, with a conciſe, and true hiſtorical Account of it, ſince it has been repreſented under ſo many different Shapes, and with ſo much Partiality, by thoſe who have treated that Subject, that, at this very Time, there are but very few Perſons in *Europe* who know the real Truth of that intricate Affair; of which I can ſpeak pertinently, ſince I was intimately acquainted with the firſt Promoter of that *Bull*, who, from my very Infancy, had taken a particular Care of my Education, and to whom I had the Honour of being related.

This illuſtrious Perſon was *Francis de L'Eſcure*, Biſhop of *Luçon* in the Province of *Poictou*, of whom it was ſaid in *France*, *Noble comme le Roy*, *ſçavant comme Saint Auguſtin*, *& pauvre comme Job*; *i. e.* As noble as the King, as learned as St. *Auguſtine*, and poor as *Job*: For in Fact he had no other *Revenue* than that of his Biſhoprick, which was not above 1000 Pounds *Sterling*.

As this honeſt Biſhop, contrary to the ſcandalous Practice of the greateſt Part of his *Brethren*, who are oftner ſeen at Court, than in their *Dioceſe*, ſpent his whole Time in his, and has never been ſeen at *Verſailles*, ever ſince he was made Biſhop of *Luçon*, he judiciouſly us'd to give to an indefatigable Study the Hours which his paſtoral Sollicitude allow'd him. In one of thoſe Hours, which prov'd fatal to *Queſnel*, his new Verſion of the *New Teſtament* fell into the *honeſt* Biſhop's Hand. The Beauty, and Fluidity of the Style, the Sublimity of the Thought, the Energy, and Strength of the Expreſſions, and the profound Learning which is conſpicuous throughout the whole Verſion, attracted the whole Attention of M. *De l'Eſcure*; who having acquir'd, while in *Sorbonne*, (whence he was taken to be made a Biſhop, with no other Recommendation than that of his particular Merit) the Reputation of the moſt profound *Theologian* of his Time, thought he could diſcover in that Book a Venom hidden under the pompous Appearance of an orthodox and ſolid Doctrine; the more dangerous, becauſe the moſt artfully diſguis'd. But as the Principles of a truly *Chriſtian* Charity were almoſt natural to him, and he was too timorous, and too jealous of the Reputation of all the different Orders of the Clergy, to attempt to blaſt it on his own private Judgment; he took the Pains to extract from the whole Verſion ſome Propoſitions, which, among an infinite Number of others, he thought to be the moſt *heterodox*; and ſent them to the Biſhops of *Rochelle*, and *Gap*, for their Sentiments, and on whoſe Judgment he entirely depended.

Theſe Biſhops, having compar'd this Extract with the whole *New Teſtament* of *Queſnel*, confirm'd by their Condemnation of the whole, in their reſpective Dioceſes, the Judgment the Biſhop of *Luçon* had form'd of it; who immediately after follow'd their Example, and condemn'd, likewiſe, by a paſtoral Inſtruction to his Dioceſans, the *New Teſtament* of *Queſnel*.

Lewis Antony de Noailles, Archbiſhop of *Paris*, a Prelate of ſignal Piety, and profound Learning, had approv'd the *new Verſion*, when firſt publiſh'd, which *Approbation* was printed at the Beginning of the Book; and therefore took as an Affront the Condemnation by the three Biſhops, ſince thereby they reproach'd him tacitly, with having been capable of countenancing an *heterodox Doctrine*; tho' the Biſhops had acted in that Caſe with all the Precaution and Reſpect due to the Archbiſhop of the *Metropolis* of the Kingdom; who was, beſides, Duke and Peer of *France*, Commander of the Order of the *Holy Ghoſt*, Cardinal, *&c.* by intreating him, before they attempted to condemn the Book, to revoke the *Approbation* he had honour'd it with; which is an undeniable Fact, ſince I was at the Biſhop of *Luçon*'s Palace, in the Country, when the Letters were wrote to that Effect; which, however, had not the deſir'd Succeſs, ſince the Archbiſhop of *Paris*, by the Advice of his Council, (by whom he was entirely govern'd, and which was then compos'd, among the reſt, of the *Prior* of the *Benedictine Monks* of the Abby of St. *Germain des Pres*, at *Paris*, of Father *La Tour*, General of the *Oratory*, of the Abbot *Gontau de Biron*, Dean of the Chapter of our Lady at *Paris*, of the Abbot *Goet*, and ſeveral other Eccleſiaſticks, eminent for their Learning, and great Piety, but all ſuſpected of *Janſeniſm*) rejected the Requeſt of the three Biſhops, as injurious to him, ſince in an *Approbation* of that Conſequence, never to be granted, but after a mature Deliberation, *non eſt ſapientis dicere non putabam*; the Archbiſhop went even farther; for, to ſhew his Reſentment to the Biſhop of *Luçon* in particular, whom he knew to have ſtirr'd up the Aſhes, and kindled the Fire, he refus'd to ordain Prieſt the Abbot *De L'Eſcure*, who was then a Student in *Sorbonne*.

The good old Biſhop, who though very Apoſtolical, had not attained yet that Degree of Perfection, as, when ſmitten on one Cheek to preſent the other, and had a ſmall Portion of levitical Blood in his Veins, reſented the Affront; and in Conſequence thereof, wrote to *Lewis* XIV. then King of *France*, a very bitter Letter againſt the Archbiſhop of *Paris*; accuſing him of countenancing *Janſeniſm*, which had always been repreſented as a very hideous Monſter to the King; and complaining of the Injuſtice lately done his Nephew, for no other Reaſon, than becauſe he, his Uncle, had condemned in his Dioceſe a dangerous Book, which the Archbiſhop of *Paris*, had been perſuaded, by the *Janſeniſts* he was environed with, to approve.

The King, who always had a very great Eſteem for the illuſtrious Houſe of *Noailles*, and for the Cardinal in particular, could by no Means approve the Letter of the Biſhop of *Luçon*; therefore having him reprimanded, for ſome Expreſſions little becoming the Reſpect he ought to have for his Couſin the Cardinal *de Noailles*, commanded *L'Eſcure* to write to his Eminence, a Letter of Excuſe. *L'Eſcure*, who ſaw the Cardinal in another Light, and conſider'd his Eminence with Reſpect to him, but as *Primus inter Pares*, made ſeveral Attempts to diſculpate himſelf from this Injunction, as far as to interpoſe the Credit of Father *le Tellier* the King's Confeſſor, and therefore much in Favour with his ſacred Perſon; but all his Efforts proved vain, for the King was reſolved the Biſhop of *Luçon* ſhould excuſe himſelf to the Cardinal, who was forced at laſt to do it.

This Submiſſion of the Biſhop of *Luçon* pleaſed the King, and diſpos'd him to liſten to the Propoſal, made to him by Father *le Tellier*, at the Intreaties of the three Biſhops; that the Affair of the New Teſtament of *Queſnel*, which began already to make much Noiſe in the Kingdom, ſhould be ſent to the Court of *Rome*; there to be examined, and if the Book was ſo dangerous, as repreſented by the Biſhops (as there was very great Reaſon to ſuppoſe it was,) his Majeſty would be pleaſed to aſk a *Bull* for its Condemnation.

The King who was not willing to condemn the Archbiſhop of *Paris*, unheard, ſent for him; and his Majeſty, who had already been perſwaded by the Party of the *Jeſuits*, whom the three Biſhops had found the Secret to engage in their Quarrel the eaſier, becauſe, there has been always ſome Jealouſy between the

Company of *Jesus*, and the Congregation of the Oratory, who were always endeavouring to rival each other, would have engaged the Cardinal to condemn himself, *Quesnel*'s Testament, by revoking his Approbation; which the Archbishop eluded, by asking Time to think about it, which the King was graciously pleased to grant him. But his Antagonists fully determined on the Condemnation of *Quesnel*, and thought that Delays in those Affairs were of a dangerous Consequence; plaid their Part so well, and obseded the King so close, representing to his Majesty that the Catholick Religion, while *Quesnel* continued in the Hands of his Subjects, was in the greatest Danger; that without waiting for the Determination of the Archbishop of *Paris*, who in fact was a long while about it; *Quesnel* was sent to the *Barre* of the Congregation of the *Holy Office*. *Clement* XI. called, while yet but Cardinal, *Francis Albano*, seated then on the Chair of St. *Peter*; who, at *Lewis* XIV. Request, appointed a select Number of Cardinals and Theologians, to examine carefully the Testament of *Quesnel*; from which they extracted at last 101 Propositions, some of which were qualified by the Congregation of the *Holy Office*, heretical, some schismatical, others tending to Heresy, Schism, *&c.* In Consequence of this Judgment, the Pope issued out a *Bull*, for the Condemnation of the said Propositions, together with the whole Testament of *Quesnel*; which *Bull* begins *Unigenitus Dei Filius*, &c.

This *Bull* was brought from *Rome* to the King of *France*, by a *Capuchin* Fryar, one Father *Timothy de la Fleche*, in *Anjou*, who was then at *Rome*, and much in Favour with *Clement* XI. The King sent it to the *Sorbonne* to be examined, who finding nothing in it contrary to the Liberties of the *Gallican-Church*, it was presented by the King's Order to the *French* Clergy, to have it accepted by them; who always very unwilling to disoblige the King, accepted that famous *Bull*, without Restriction or Reservation; fourteen Bishops excepted, who finding the *Bull* conceived in Terms too general, and believing several of the 101 Propositions not at all deserving the Qualifications they were stigmatised with, refused the accepting it 'till the Pope would be pleased to explain himself in clearer Terms, and to give some Reasons for having condemned several Propositions, whose *obvious* Sense was Orthodox; and to which, in their humble Opinion, it was almost impossible to give an Heterodox one.

The King was not at all pleased at this Refusal of the fourteen Bishops; being persuaded by the prevailing Faction, that their Obstinacy would perhaps occasion a Schism in the *Gallican Church*, and therefore he should exert his Authority, to bring them to a Compliance; but as some of those Bishops were nearly related to some of the Favourites at Court, particularly that of St. *Malo* in *Britanny*, who was Brother to *des Marests*, Secretary of State; the King contented himself, considering their Obstinacy (as it was called then, and that the *Bull* had a vast Majority on its Side) to command those Bishops to depart for their Dioceses, and not to appear at Court till they were determined to accept the *Bull*. What's the most surprising in this Affair, is, that the *Cardinal de Noailles*, who had always refused to revoke his Approbation of the Version of *Quesnel*, was one of the first who signed the *Bull*, without the least Difficulty; and went even so far, as to have a pastoral Instruction publish'd for its Acceptance, throughout his whole Diocese.

The *Bull*, *Unigenitus*, having met with so great Succels in *France*, to the general Satisfaction of its Partisans, and of my Friend the Bishop of *Lucon* in particular; was registered in the Parliament of *Paris*, and sent to all the other Parliaments of the Kingdom, to be registered likewise; though it met with a very great Opposition in the Parliament of *Britanny*, thro' the Means of the Attorney General of that Parliament, who declared himself an *Anticonstitutionaire*, as they have been called since, under the Supposition, that the *Jesuits* whom he hated mortally, had ushered it into *France*.

In Consequence of this Acceptation of the *Bull*, the *Constitutionairs* Bishops (a Title given to those who had accepted it, in Contradiction to the Opponents) published in their respective Dioceses, Mandements and pastoral Instructions, wherein they did what others refused to do; the explaining the several Propositions condemned by the *Bull*, and giving them what Sense they pleased. Then the greatest Part of the Kingdom was *Constitutionair*, why? because it pleased the King, who was one himself; but his Death happening soon after the Birth of the *Bull* (for if I am not mistaken, the *Bull* was brought into *France* towards the latter End of 1713, and the King died 1715,) the Affair of the *Bull* changed Face all on a sudden; for the *Sorbonne* first, who had accepted, *Purement & Simpliment*, i. e. without Restriction, began to sing the Palidony, and to revoke its Acceptation, alledging for Reason of so unexpected a Change, that they had accepted it only to please the King (a very good Reason for a learned Society, on whose Decisions depends in some Measure the Faith of the whole Kingdom!) most of the heretofore *Constitutionair* Bishops, and the Cardinal *de Noailles*, among the rest, followed the Example of the *Sorbonne*, and became *Anticonstitutionairs*, because that Party was very likely to be no longer the prevailing one at Court; from whence Father *le Tellier*, and his Protectress *Maintenon*, had been already banished.

However the *Sorbonne*, being reproached with its scandalous Recantation, which was a convincing Proof of her Ignorance, or want of Zeal for the Religion she professed, or of Pusillanimity; alledged for Excuse, that she had not entirely rejected the *Bull*, but on the contrary, was ready to accept it as soon as the Pope would give the Explanations required; for which they sent to *Rome*, *Chevalier*, one of the Archbishop of *Paris* Secretary, but all to no Purpose: For the Court of *Rome*, instead of granting their Request, treated them all as they really deserved, *i. e.* as a Pack of Ignorants, or of Knaves, or of Pusillanimous, not fit to be intrusted with the Conduct of Christ's Flock; and insisted that they should stand by their former Acceptation; and then the Pope would oblige them perhaps, with an Explanation of the *Bull*; which Difficulties started on both Sides, could never be surmounted; for the Court of *Rome* insisted on a blind Obedience, and the *French* Clergy wanted to see clear. Then the Party of the *Anticonstitutionairs* grew every Day more formidable, by the Acquisition of a vast Number of Proselytes of Distinction and Merit. The Party of the Cardinal, who then having nothing to fear from the Court, too much employed otherways for to interfere in religious Matters; throw'd off the Mask, and declared openly against the *Bull*; and the *Oratorians* took place of the *Jesuits*, who were interdicted throughout the whole Diocese of *Paris*, from Preaching and hearing the Confessions. Though a Paper-war was conducted on both Sides, with a great deal of Zeal, and very little of Christian Charity; the Dispute grew so warm, and the Books published by each Party so common, that there was scarce a Person in the whole Kingdom, who pretended to an Education above the common, who did not espouse the Party, which he thought suited himself; even the *fair Sex* signalized themselves on that Occasion; there were few Ladies of Distinction and Merit, who did not declare *Pro* or *Con*, and few who had not learned from St. *Augustin*, whom they were often found reading; how to explain the Propositions of *Quesnel*.

His Royal Highness the Regent, a Prince as much versed in Theology, as he was in all the Arts and Sciences, so much thought those religious Quarrels beneath his Notice, that he was resolved to leave those Affairs to the sole Determination of the Clergy, whom they most properly belong to, and took very little or no Cognizance of it, 'till the Court of *Rome* provoked out of Measure, at the pretended Revolt of the Cardinal *de Noailles*, whom she thought obliged

obliged by his Rank in the Church, to ſupport her Intereſt, threatened him with the Thunder of the *Vatican*, if he continued in ſo flagrant a Revolt againſt the *Holy See*; and finding him inflexible, paſſed at laſt from the Menaces to the Effects, by ſending to his Eminence a *Brief*, which ſuſpended him of his Functions, and which was to be the Forerunner of a *Bull* of Excommunication; at which the Cardinal being alarmed, he went to carry the *Brief* to the *Regent*, complaining to him at the ſame Time of the exceſſive Rigour of the Court of *Rome*. His Royal Highneſs, promiſed him, that he would order the King's Miniſter at *Rome*, to appeaſe the *Pope*, and ſtop farther Proceeding againſt his Eminence; bidding him at the ſame Time, to continue in the Exerciſe of his Paſtoral Functions; but however, if the Regent had forgot his Promiſes, or, if the Court of *Rome* was tired of the tedious Procraſtinations of the Biſhop of *Paris*; the thundering *Bull*, ſo much dreaded by the Cardinal, came at laſt to the *Pope*'s Nuncio at *Paris*, who took Care to have it immediately carried to his Eminence, who had no ſooner received it, but he went to carry it to the Regent, as to his laſt Refuge; in order to conſult with him, what Meaſures to take to extricate himſelf out of the Labyrinth he was engaged in. His Royal Highneſs, who in all Appearance, was not that Day in his beſt Humour, heard the Complaints of the Cardinal with ſome Impatience, and for Concluſion told him, That he could not help what the Court of *Rome* had done againſt him; That if he had been afraid of her Procedures, he ſhould have forbore offending her; and that he would be much obliged to him, if he would forbear likewiſe, troubling him for the future, with his Differences with the *Holy See*, ſince he had ſomething elſe of a far greater Conſequence to mind; promiſing him however, that he would hinder the Fulmination of the *Bull*, and let the *Pope* know, that in that Caſe he had exceeded his Juriſdiction; having none over the King's Subjects, not even a Cardinal, while in the King's Dominions. If the Regent then, was ſo good as his Word, or not, the Truth is, that the *Bull* was concealed, and never made publick; and what I know of it, I learned it from a Relation of mine, who had then the Confidence of his Royal Highneſs; who was pleaſed to tell him, That if he was to give Ear to that Prieſt, he would be more troubleſome to him than the Government of the whole Kingdom. I regaled the Biſhop of *Luçon* with this News (for I was then at *Paris*,) which I knew would be very agreeable to him; and his whole Anſwer to it, was, *Rira bien, qui rira le Dernier*, he who ſhall laugh laſt, will laugh in Reality; ſo much as to ſay, that he expected to ſee his Party the prevailing one at laſt.

Very near the ſame Time, *i. e.* toward the latter End of 1719; a very bitter Satyr was publiſhed againſt the *Sorbonne*, in form of a Letter, which ſhould have been written by the Doctors of *Geneva*; in which that learned Society was complimented, for having eſpouſed the Defence of *Calvin*'s Doctrine. What pleaſed me moſt during that Controverſy, is, that the Books which were publiſhed by the *Anti-conſtitutionairs*, which were all very well wrote, were given *gratis*, to thoſe who had any Friend in that Party; ſo that in a ſhort Time, I found myſelf provided at that cheap Rate, with almoſt a whole Library. The ſole Advantage the Kingdom of *France* reaped from thoſe Diſputes, was, that the inferior Clergy, applied themſelves more ſeriouſly than they had done before, to the Study of the *Sacred Letters*; and that there have been ſeldom found ſince in Country Pariſhes, thoſe illiterate Prieſts who thought themſelves ſufficiently learned if they could underſtand *Latin*.

At laſt the *Anti-conſtitutionairs* grew ſo formidable, as to ſee themſelves in a Condition to defy all the Attempts of the Court of *Rome* againſt them; the *Vatican* could have then thunder'd, as often, and as long as he pleas'd, the Archbiſhop of *Paris* had *Iron* to oppoſe to it; his Eminence us'd to retire, every *Saturday*, to his Country-Seat at *Conflans*, near *Paris*, where he was met by the moſt conſiderable of his Party, where Meaſures were concerted, as well to ſtrengthen themſelves, as to weaken their Enemies. At that Time ſeveral *Monks* and *Fryers*, tir'd of the *monaſtick* Life, became *Anti conſtitutionairs*, on Purpoſe to have ſome plauſible Reaſons to quit their Solitude; among whom there were ſeveral *Monks*, of the famous Abbey of *la Trape* in *Normandy*, who all came to put themſelves under the Cardinal's Protection; whence the *Conſtitutionairs* took Occaſion, to reproach his Eminence with being the Refuge of *Apoſtates*.

The Court of *Rome* ſeeing herſelf thus braved by potent Enemies, and afraid that if ſhe continued to act with that deſpotick Power, ſhe had 'till then affected in this Affair; the *Gallican Church* would be glad perhaps of a favourable Opportunity of ſhaking off the *Roman* Yoke, by the Election of a Patriarch, which would be a great Check to the *Pope*'s Treaſury, conſidering the immenſe Sums, ſent from *France* to *Rome*, for *Bulls*; began to deſiſt from Part of their high Pretenſions; and offered, that if the *Anticonſtitutionairs* would accept the *Bull*, even under the Reſtriction of an Explanation, ſhe would give that Explanation. But the *Anti-conſtitutionairs*, who were grown too potent, and had gained too much Ground to enter into a Capitulation with their Enemies, inſiſted on that Explanation, previouſly to the Acceptation of the *Bull*; pretending that they could not accept it before they knew what they were to accept, nor condemn Propoſitions as *heretical*, *ſchiſmatical*, &c. before they could be perſwaded that they were ſuch; that Chriſt himſelf, whoſe Vicar upon Earth the *Pope* ſtiled himſelf, did never refuſe to explain to his Diſciples the Parables he propoſed to them, when they did not underſtand them; that acting otherwiſe was enſlaving, and tyrannizing a Chriſtian Conſcience; that his Holineſs, whoſe Judgment in that Affair had been pronounced but *ex Cathedrâ*, which Judgment he knew himſelf, was not conſidered as infallible by the *Gallican Church*; could have been miſtaken in the Condemnation of *Queſnel*, or deceived by thoſe who had examined his Book. That though they would not pretend to juſtify all the 101 Propoſitions extracted from it; there were nevertheleſs a vaſt Number of them which had a great Air of Orthodoxy, and appeared as ſuch to the whole *Gallican Church*; and therefore 'till theſe were explain'd, they could not find it agreeable to their Conſcience, to condemn the others, much leſs to condemn the whole.

But, however, theſe Reaſons, in all Appearance very juſt, and very agreeable to the Practice of the Primitive Church, and of Chriſt himſelf; could not perſuade the Court of *Rome* to that Compliance, ſeemingly ſo neceſſary to re-eſtabliſh the Peace of the *Gallican Church*; ſhe thought then, that ſhe had already gone too far, and that her too great Condeſcenſion had rendered her Enemies more daring, and more inſolent; therefore re-aſſuming her former Haughtineſs (as the *Anti-conſtitutionairs* called it) and her former imperious Tone, ſhe renewed her Menaces againſt the Cardinal, and his Party; and even excommunicated ſome of the moſt conſiderable of the *Anti-conſtitutionairs*; who appealing from that Excommunication to the future Council, continued their Functions. Neither do I believe if even *Clement* XI. had granted the Explanation ſo warmly, and ſo obſtinately inſiſted upon by the *Anti-conſtitutionairs*, that ſuch Condeſcenſion, had much contributed towards reſtoring the Peace of the *Gallican Church*; and if they had not ſtarted ſome other Difficulties, on Purpoſe to have ſome ſpecious Pretext, to continue in their Oppoſition; for a *Party* has ſo many alluring Charms, that thoſe who are once engaged in it, can ſcarcely be perſuaded to leave it: That of the *Anti-conſtitutionairs*, had all that could the moſt flatter our natural Inclinations, in all Ranks and Profeſſions. The Learned,

who were ambitious to appear publickly as ſuch, met among them with the greateſt Encouragement, and were furniſh'd with frequent Occaſions of exerciſing their Talent. A great many of the Clergy, who had till then been bury'd in the Duſt of the Church, began to be taken Notice of, if it was but by their being only accounted *Anti-conſtitutionairs*; thoſe of more Merit found the Secret by the ſame Means, and under the ſame Name, to introduce themſelves into the Palaces of the Great, and the moſt ſelect Companies of the Party, whence, without it, they had been, perhaps, for ever excluded. Their Directors were intruſted with the Direction of the Conſcience of ſeveral Ladies of the firſt Quality, who provided profuſely to the daily Subſiſtence of their Father Confeſſor, whoſe *Confeſſional* made always a very ſplendid Appearance, while thoſe of the *Conſtitutionairs* were cover'd with Duſt, and Cobwebs; for that other Party, pretending to have the Truth on its Side, which they thought every true *Chriſtian* was oblig'd to follow, they us'd to take no Pains, nor to put themſelves to any Inconvenience, to gain *Proſelytes*; beſides, as that Party was chiefly govern'd by *Jeſuits*, who do not like to part with much *Money*, there was little or none *expended* for the Cauſe. The pooreſt *Eccleſiaſticks*, who for ſeveral Years had been oblig'd to live on the *Retribution* of their Maſs, which, in ſome Places, is but 10 *Sols*, beſides what they could get by their daily Aſſiſtance at their *parochial Church*, were ſeen, all on a ſudden, to change a ſcanty and thread-bare *Soutane*, or Gown, which had ſeen many *Luſtres*, for the gay Apparel, *d'un Abbé Coquet de Paris*, of a *Pariſian Abbot*; and with no other Toils, then declaring himſelf *Anti-conſtitutionair*, could find the *Philoſopher's Stone*. The Ladies were ſo elevated at their being tantaliz'd with the Notion, that by reciting with the Prieſt, the *Canon of the Maſs*, (which, to render it eaſy to them, the Prieſt was to ſpeak with a loud Voice, contrary to the Rubrick of the *Roman Church*) they could not only ſay the Maſs, but likewiſe conſecrate the Euchariſt, as well as the *Pope* himſelf, that they ſpar'd nothing to gratify thoſe who had granted them that *ineſtimable Privilege*, of which they were ſo fond, that ſome Ladies, who before could ſcarcely have been perſuaded to hear Maſs once a Week, and then it muſt have been a very ſhort one, elſe they had fainted away; were ſeen every Morning at Church, to ſay two or three Maſſes, while a Prieſt, tho' he had no other Livelyhood, could ſay but one. There was this other very remarkable *Difference*, that they were allow'd to ſay it in *French*, while the Prieſt was not permitted yet to ſay it otherwiſe than in *Latin*; ſo that the *Anti-conſtitutionairs* had found a Secret which had not been imagin'd ever ſince the Extinction of *Paganiſm*, to eſtabliſh among themſelves *Women Sacrificators*. Another ſignal Advantage for the poor Brothers *Anti-conſtitutionairs*, was, that, like *Capuchin Fryars*, they could have travell'd throughout the whole Kingdom without *Money*, and nevertheleſs wanted for nothing; for they were ſure of being kindly receiv'd, and very well entertain'd, by the moſt wealthy among them, on that ſingle *Ticket*, ANTI-CONSTITUTIONAIRS.

The religious Orders eſpous'd each their Party, the *Benedictins*, and almoſt all the other *Monks* who had any *Revenues*, declar'd againſt the *Bull*; and all the *Fryars*, eſpecially thoſe of the Order of St. *Francis*, for the *Bull*; and among theſe the *Capuchin Fryars*, call'd, in *France*, *les Valets de Pied des Jeſuites*, the Running-Footmen of the *Jeſuits*, were the moſt zealous *Conſtitutionairs*. Tho' among them all, there were ſome Convents *mi-partite*, *i. e.* that in thoſe Convents there were ſome *Conſtitutionairs*, and ſome *Anti-conſtitutionairs*, which ſometimes caus'd a great Confuſion among them; even the *Monaſteries* of *Nuns* were not free from it; for as they had alſo took Party in the Cauſe, there happen'd often ſuch warm Diſputes among them, that they ſometimes ended in an open Rupture, attended with Blows, leaving in the Field of Battle a vaſt Number of torn Veils, and ſome bloody Noſes; and then thoſe among them who were more tir'd of their Confinement than they were good Partiſans, apply'd to the General of the Order, or to the *Dioceſan*, if they were under his Juriſdiction, and knew him of the ſame Party, for Leave to quit their *Cloyſter*, where they could live no longer with a *ſafe Conſcience*.

Things continu'd in this Fluctuation in the *Gallican Church*, during the whole Regency of the late Duke of *Orleans*, and even for ſome Time after; till the late Duke of *Bourbon*, who, at the Regent's Deceaſe, had taken the Reins of the Government, and who was influenc'd by M. *Chauvelin*, who had always been for the *Bull*, took Cognizance of that Affair, and made the *Conſtitutionairs* breed a-new, by taking the *Jeſuits* into his Favour, and Meaſures to have the *Bull Unigenitus* receiv'd throughout the whole Kingdom, baniſhing thoſe who prov'd refractory. In this Turn of Fortune, the Archbiſhop of *Paris* appear'd again wavering, and a ſecond Acceptation of the *Bull* could have been expected from him, had not his Council repreſented to him, that by ſhewing ſo much Inſtability in his Sentiments, he would prepare Matter of Laughter to his Enemies, and be deſpis'd by both Parties; that his Eminence had put himſelf entirely out of Power of ever recanting with the leaſt Appearance of Honour, by having publiſh'd ſo many *paſtoral Inſtructions*, in Defence of its former Retractation. His Eminence yielded to theſe Perſuaſions, which were, without doubt, very reaſonable, and continu'd, at leaſt in Appearance, a very good *Anti-conſtitutionair*.

To provide for the Relief of thoſe of their Brethren who during this new Storm were ſent to Exile, the *Anti-conſtitutionairs* appointed truſty Queſtmen, who were to go, among the Party, to collect the charitable Gifts which every individual Member (in a Condition to do it) was to contribute towards this Relief; by which Means, they gather'd immenſe Sums of Money, which they diſtributed to thoſe in Affliction, with a great deal of Generoſity, Compaſſion, and Œconomy; entruſting with the *Money* none but thoſe on whoſe Probity, Prudence, and Secreſy, they could entirely rely; I myſelf have travell'd from *Paris* to *Lyons*, in my Journey to *Italy*, at the latter End of 1725, with one of theſe truſty Friends and Œconomiſts, who was going to viſit thoſe of his Brethren who were baniſh'd into the *Sennonois*, *Auxerois*, *Burgundy* and *Lionnois*; and as I have never been ſuſpected by either Party, becauſe I eſpous'd none, tho' very well known to both, he made no Scruple to introduce me to thoſe of his Friends he viſited on the Road; complimenting me often, that I could be of very great Service to them, would I but declare in their Favour, which I have always thought fit to decline, tho', in a great many Particulars, I approve their Conduct, and blame it in ſome others: For their Requeſt to the *Pope* was certainly very juſt, if founded on juſt Principles, at leaſt in outward Appearance it was very agreeable to the Practice of the primitive Church, which has never exacted that paſſive Obedience from the *Fideles*, as we'll ſhew, in our Treatiſe of the *Church*, under the Letter *C*. There reign'd among them a very great Unanimity, Diſintereſtedneſs, and unfeigned Charity; and the vaſt Number of very learned Men, of all Orders, that Party was compos'd of, could have render'd it reſpectful to a Perſon who had been neither for or againſt the *Bull Unigenitus*. Very few of them were guilty of Diſſimulation or Hypocriſy, and their Converſation was open, mild, and agreeable; free from thoſe extraordinary Heats, and Invectives, which, in other Caſes, ſeem inſeparable from the Spirit of Party; as often as I have been among them, (and I was once a whole Summer at the *Bergeries*, a Country Seat of the Abbot *De Caumartin*, then Biſhop of *Vannes* in *Britanny*, among ſeveral of the moſt conſiderable of that Party) and all that while never heard any of them ſpeak the leaſt diſreſpectfully of their Adverſaries; and when the bitterеſt Satire written [illegible]

them, was brought to them, I have always heard them admire it, if it was wrote with Judgment, Spirit, and Erudition; and if not, they ſaid nothing: As they fear'd nothing, they were not afraid to ſpeak before any Body; or rather, they had all too much of a *Chriſtian* Courage, and Intrepidity, to be afraid of any Thing; for I have ſeen them receive the News of the greateſt *Diſappointments* with that Tranquillity and Calmneſs, which had been admir'd in the *Chriſtians* of the primitive Church, while conducted to the *Scaffold*. The *Books* in their *Defence*, were written in ſo florid, elegant, tho' fluid and eaſy Style, that I have read them over ſeveral Times, and always with the ſame indicible Pleaſure. When they could grant any *Favour*, they did it with that Chearfulneſs and Satisfaction, as if they had receiv'd it themſelves; and when they could not, they ſeem'd really ſorry, and vex'd.

As for the *Conſtitutionairs*, they had very little other Merit than that of their Cauſe. There were certainly, among them, as among their *Antagoniſts*, a vaſt Number of Perſons eminent for their Birth, Learning, Piety, and Virtue; but, for the Generality, they were not ſo moderate, ſo diſintereſted, nor ſo charitable, as the others; Self-intereſt was the *predominant Paſſion* among them, and they always ſpoke with that Caution, even before their moſt ſincere Friends, as if they were afraid of their own *Shadow*; truſting more to the *Authority* and *Power* of the *Prince*, than to the *Equity* of their *Cauſe*. The Biſhop of *Luçon* himſelf, certainly, one of the beſt among them, could not help expreſſing his Uneaſineſs about it; and he has often complain'd, in my Hearing, of the Unworthineſs of thoſe who pretended to be the moſt *zealous Aſſerters* of the *Power* and *Authority* of the *Roman Church*; he us'd to blame highly the loud *Clamours*, and bitter *Invectives* of the *Fryars*, and other Underſtrappers *Conſtitutionairs*, whom he always look'd upon with the greateſt *Scorn* and *Contempt*; ſaying, that the Cauſe of the Church was not to be defended with ſuch *weak Weapons*, and in ſo ſcandalous a Manner. But, however, with all theſe ſeeming Diſadvantages, and according to his *Prophecy*, (*rira bien qui rira le dernier*) that Party gain'd once more the upper Hand; and the late Pope *Benedict* XIII, who wiſh'd for nothing more than to ſee all thoſe Diſputes in the *Gallican Church* terminated in an amicable Manner; gave, at laſt, ſome Satisfaction to the Archbiſhop of *Paris*, that, thro' the Intreaties of that *excellent Miniſter*, Cardinal *De Fleury*, he re-accepted, in a Manner, before his Death, the *Bull Unigenitus*; tho' we have not been capable yet to know what Sort of *Temperament* was us'd by *Benedict* XIII. to engage him to it; for that *Pope* (one of the beſt who was ever ſeated in the *Roman* Chair) had a ſecret Abhorrence of the *deſpotick Power*, ſeveral of his *Predeceſſors* had uſurp'd; and it is very certain, that he blamed, in a great many Reſpects, the *too ſevere Conduct* of the Court of *Rome*, in the Affair of the *Bull*, for which he could not eſcape being accus'd, during his *Pontificate*, of being too indulgent to the *Janſeniſts*, as if he had been one himſelf. 'Tis true, that he found ſo great a *Contradiction* between the Humility of *Chriſt*, of whom he thought himſelf to be the Vicar on Earth, and the Pomp of the Court of *Rome*, that he would, when he could, deſpiſe the one to practiſe the other.

The Example of the Cardinal *De Noailles*, as to his new Acceptation of the *Bull*, was follow'd but by very few of his Partiſans; and as his *Eminence* ſurviv'd but a few Months to that Acceptation, I have not heard how far his Inconſtancy in this Affair affected his *Reputation*; for it is not the Practice in *France* to rake the Aſhes of the Dead, hence to have Occaſion to aſperſe their *Reputation*; all I know, is, that the Party of the *Anti-conſtitutionairs* is yet almoſt as *potent* as ever, tho' very ſilent.

In paſt Ages the *Bulls* of *Popes* were of a greater Weight in *France*, and far more reſpected, than they have been ever ſince, under *Philip the Fair*. *Boniface* VIII. having firſt but threaten'd to *excommunicate* that great Prince, for raiſing the current Coin of his Kingdom a little above its intrinſick Value, (forc'd to it by the urging *Neceſſities* of the *State*) *Philip* began to open his Eyes, and perceiv'd (but not too late) that the Court of *Rome*, who ſhould have contented her ſelf with the fiſhing of *Souls*, have too long fiſh'd in the *Temporality* of Princes, and uſurp'd a Power even above that which Sovereigns have receiv'd immediately from *God*. Therefore he thought fit to pare *Boniface*'s Nails, and to let him know, that tho' the next Day after his *Intronization* he had appear'd with a *Sword* by his Side, as if he had both the ſpiritual and temporal Power, and flatter'd himſelf that he had in his Hand the *univerſal Monarchy*, and could depoſe Princes at Pleaſure; he nevertheleſs was nothing elſe but what thoſe Princes had been pleas'd to make him, and what he ſhould ceaſe to be, whenever they pleas'd. This Hint of *Philip* procur'd the *Fulmination* of a *Bull* of *Excommunication* from *Boniface*, who therein put his whole Kingdom under an *Interdict*, abſolved his Subjects from their Oath of Allegiance, and gave the Kingdom of *France* to the firſt who would invade it. *Philip* appeal'd from this *Bull*, as of an Abuſe, to the future Council, and ſent *Philip* of *Nogaret* in Ambaſſy to *Boniface*, then at *Avignon*; who hearing *Boniface* ſpeak in an arrogant Manner of the King his Maſter, ſtruck the *Pope* in the Face with his Hand arm'd with an iron *Gantlet*, for *Philip* was then arm'd *cap-a-pee*. This Preſumption of *Philip* was puniſh'd by another *Bull* of *Boniface*, full of Scurrilities and Invectives againſt the King of *France*, whom he threatens *to govern with an iron Rod, and to break as an earthen Veſſel*. But this *Bull* was as little minded by the King, as the former; and ſeeing that *Boniface* was *incorrigible*, he found himſelf oblig'd, at laſt, to ſend the ſame *Nogaret*, at the Head of an Army, who beſieg'd *Avignon*, took it by Storm, ſeiz'd the *Pope*, and had him led thro' the Streets, mounted on an Aſs, his Face towards the Tail, and afterwards confin'd Priſoner. *Boniface* died in his Confinement, three Days after this Mock-triumph, while he was writing another *Bull* againſt *Philip the Fair*.

Ever ſince this fatal *Epocha*, the Court of *Rome* has loſt a great deal of Ground in *France*; and the *French*, at preſent, hear the Vatican Thunder, with as much Indifference as the other *Roman Catholick* Countries are frighted at it.

Nor do the *Spaniards* admit the Pope's *Bulls* implicitly; but having been examin'd by the King's Council, if there appear any Reaſon for not executing them, Notice thereof is given to the *Pope* by a Supplication; and the *Bull*, by this Means, remains without Effect.

To fulminate *Bulls*, is to make Publication thereof by one of the three Commiſſaries, to whom they are directed; whether he be the Biſhop, or Official. This Publication is ſometimes oppos'd; but when it is, the Fault is not charg'd on the *Pope* who iſſu'd the *Bull*, but an Appeal is brought to him againſt the Perſon who is ſuppos'd to make it.

The *Bull in Cœnâ Domini*, is a *Bull* read every Year on *Maunday-Thurſday*, in the *Pope*'s Preſence; containing various *Excommunications* againſt *Hereticks*, thoſe who diſobey the *See*, who diſturb or oppoſe the Exerciſe of Eccleſiaſtical Juriſdiction, *&c.* *Leo* X. caus'd *Luther* to be *excommunicated* in it, by Name; which *Bull* is but a pure Formality, and a vain Ceremony.

After the Death of the *Pope*, no *Bulls* are diſpatch'd during the Vacancy of the See; to prevent any Abuſes thereof, as ſoon as the *Pope* is dead, the Vice-Chancellor of the *Roman* Church takes the Seal of the *Bulls*, and, in the Preſence of ſeveral Perſons, orders the Name of the deceas'd *Pope* to be eras'd, and covers the Out ſide, on which are the Heads of St. *Peter* and St. *Paul*, with a linnen Cloth, ſealing it up with his own Seal, and giving it, thus cover'd, to the Cham-

Chamberlain, to be preſerv'd, that no *Bulls* may be ſeal'd with it in the mean Time.

There are other *Bulls*, beſides thoſe of the *Pope*, and, among the reſt, the GOLDEN BULL, (thus called from a golden Seal fix'd to it, ſuch as were us'd by the Emperors of *Conſtantinople*, annex'd to their Edicts. This Denomination was peculiarly given to an Ordinance, or Statute, made by the Emperor *Charles* IV. in 1356, ſaid to have been drawn up by that celebrated Lawyer *Bartoli*, and ſtill reputed the *Magna Charta* of the Empire. Till the Publication of the *Golden Bull*, the Form and Ceremonies of the Election of an Emperor were dubious, and undetermin'd; and the Number of Electors not fix'd. This ſolemn Edict regulated the Functions, Rights, Privileges, and Pre-eminencies of the Electors. The Original, which is in *Latin*, is kept at *Frankfort*, where the Election of the Emperor is to be made. On the Backſide are ſeveral Knots of black and yellow Silk; to which hangs a *Bull*, or Seal of Gold. This Ordinance, containing thirty Articles, was approv'd of by all the Princes of the Empire, and remains ſtill in Force. The Election of the Emperor is by it declar'd to belong to ſeven Electors; three of them *Eccleſiaſticks*, *viz.* the Archbiſhop of *Mentz*, *Treves*, and *Cologne*; and four *Seculars*, *viz.* the King of *Bohemia*, Prince *Palatine*, Duke of *Saxony*, and Marquis of *Brandenburg*.

CALENDAR.

CALENDAR, (from *Calendæ*, a Word antiently wrote in large Characters, at the Head of each Month) is a Diſtribution of Time, accommodated to the Uſes of Life; or (as defin'd in the Schools) *Dierum ac Menſium, ex quibus annus conſtat, omniumque, quæ Diebus, ac Menſibus adjuncta ſunt, Ordinatio:* An Order of the Days and Months which compoſe the Year, and of all that's added to thoſe Days and Months. Therefore we muſt conſider, in the *Calendar*, the Day, the Week, the Month, the Year, the Biſſext, the Cycle, both Solar and Lunar, and all that has any Relation to the Doctrine of Time. We'll begin with the *Day*.

The DAY is a Diviſion of Time drawn from the Appearance and Diſappearance of the Sun. The *Day* is of two Kinds, *artificial*, and *natural*.

Artificial Day, is the Stay of the Sun above the Horizon, in Oppoſition to which, the Time of Darkneſs, or the Sun's Stay below the Horizon, from ſetting to riſing again, is call'd *Night*.

Natural Day, call'd alſo *civil Day*, is the entire Revolution of the Sun from Eaſt to Weſt, whereby it returns to the ſame Point of the *Heavens* whence it had departed; or the Time wherein the Earth makes a Rotation on its Axis.

This Revolution of the Sun is commonly divided into twenty-four equal Parts, call'd *Hours*; each *Hour* into ſixty *Minutes*; each *Minute* into ſixty *Seconds*; each *Second* into ſixty *Thirds*, &c.

There are divers Kinds of *Hours*, us'd by Chronologers, Aſtronomers, Dialiſts, &c. Sometimes *Hours* are divided into *equal* and *unequal*.

Equal Hour, is the twenty-fourth Part of a Day and Night preciſely; that is, the Time wherein fifteen Degrees of the Equator mount above the Horizon; theſe are alſo call'd *equinoctial Hours*, becauſe meaſur'd on the *Equinoctial*; and *aſtronomical*, becauſe us'd by Aſtronomers. They are alſo differently denominated, according to the Manner of accounting them in different Countries.

Aſtronomical Hours, are *equal Hours*, reckon'd from Noon, or Mid-day, in a continu'd Series of twenty-four. *Babyloniſh Hours*, are *equal Hours*, reckon'd from Sun-riſe, in a continu'd Series of twenty-four. *European Hours*, are *equal Hours*, reckon'd from Midnight; twelve from thence to Noon, and from Noon to Midnight twelve more. *Jewiſh* and *Turkiſh*, or *planetary*, or *antient Hours*, are twelfth Parts of the *artificial Day* and *Night*; hence, as it is only in the Time of the *Equinoxes* that the *artificial Day* is equal to the *Night*; it is then, only, that the *Hours* of the *Day* are *equal* to thoſe of the *Night*; at other Times they will be always either *increaſing*, or *decreaſing*. They are call'd *antient*, or *Jewiſh Hours*, becauſe us'd by the *Antients*, and ſtill among the *Jews*. They are call'd *planetary Hours*, by reaſon the Aſtrologers pretend that a *new Planet* comes to predominate every *Hour*; and that the *Day* takes its Denomination from that which predominates the firſt *Hour* thereof; as Morning from the *Moon*, &c.

We muſt obſerve here, that among the *Jews* there were four *Hours* of the Day eſpecially appointed for their Prayers, *viz. prima*, *tertia*, *ſexta*, and *nona*. *Prima*, *prime*, or the *firſt Hour*, began at Sun-riſing. *Tertia*, *tierce*, or the *ſecond Hour*, anſwer'd to our Nine in the Morning. *Sexta*, *ſext*, or the *third Hour*, to our Twelve, or Noon. And *Nona*, *none*, or the *fourth Hour*, to our Three in the Afternoon. The whole Interval of *three Hours*, allow'd to two of theſe *Hours* of Prayers, *viz.* between *tertia* and *ſexta*, retain'd the Name of *firſt Hour*, *viz.* between *tertia* and *ſexta*: As when, for Example, 'tis mention'd Mark xv. 25. *And it was the third Hour, and they crucify'd him.* And John xix. 14, 16. *Chriſt* is ſaid to have been, *about the ſixth Hour*, deliver'd to the *Jews* to be crucify'd. Which two Paſſages, tho' implying an apparent Contradiction, can be reconcil'd in this Manner, *viz.* that *Chriſt* had been deliver'd to the *Jews*, by *Pilate*, in the *third Hour*, if the *Hour* be taken for the Interval between *tertia* and *ſexta*; and about the *ſixth Hour*, if it be taken for the *Hour* of *Prayers*, which was then very near.

Unequal, or *temporary Hours*, are twelfth Parts of the *artificial Day* and *Night*. The *Obliquity* of the *Sphere* renders theſe more or leſs unequal at different Times; ſo that they only agree with the *equal Hours* at the Time of the *Equinoxes*.

The *Days* compoſe the WEEK, which is a continual Succeſſion of *ſeven Days*.

The Origin of this Diviſion of *Weeks*, or of computing Time by *Sevenths*, is greatly controverted. Some will have it to take its Riſe from the four Quarters, or Intervals of the *Moon*, between her Changes or *Phaſes*; which being about ſeven Days diſtant, gave Occaſion to the Diviſion. Be this as it will, the Diviſion is certainly very antient. The *Syrians*, *Egyptians*, and moſt of the oriental Nations, appear to have us'd it from all Antiquity, tho' it did not get Footing in the Weſt till *Chriſtianity* brought it in. The *Romans* reckon'd their Days, not by *Sevenths*, but by *Ninths*; and the antient *Greeks* by *Decades*, or *Tenths*.

But, however, the Diviſion of the *Week* into ſeven Days, is, in my Opinion ſo antient, that it ought to be attributed to God; who reſted himſelf from his Work the ſeventh Day. Hence the *Jews* took Occaſion, to appoint that ſame Day for a Day of Reſt, which they called *Sabbath*; and which Chriſtians have transferred to *Sunday*, in Honour of Chriſt's Reſurrection. The *Jews* uſed alſo to give the Name of *Sabbath* to the whole *Week*: Hence this of the *Phariſee*, Luke xviii. 12. *Jejuno bis in Sabbato*, I faſt twice in the *Sabbath*, or *Week*: Hence alſo, *Matt.* 21. *v.* 1. and elſewhere, the firſt of the *Sabbath*, is the firſt Day of the *Week*. But in the *eccleſiaſtical Rite*, the firſt Day of the *Sabbath*, or *Sunday*, is

is called *feria prima*, the *first feria*, to which ſucceeds the *ſecond feria*, &c. So that as among the *Jews*, the ſixth Day of the *Week* was *Paraſceve*, or the Preparation to the *Sabbath*; likewiſe the *Sabbath* of the *Jews*, is among the *Chriſtians*, the *Paraſceve*, or Preparation for *Sunday*.

Some Authors will have the Uſe of the *Weeks*, among the other eaſtern Nations, to have proceeded from the *Jews*; but with little Appearance of Probability. It is with better Reaſon, that others ſuppoſe the Uſe of *Weeks* among the Heathens of the Eaſt, to be a Remain of the Tradition of the Creation, which they had ſtill retained with divers others. This is the Opinion of *Grotius*, *de verit. Relig. Chriſt. Lib.* 1. who likewiſe proves, that not only throughout the Eaſt, but even among the *Greeks*, *Italians*, *Celtæ*, *Sclavous*, and even the *Romans* themſelves, the Days were divided into *Weeks*; and that the ſeventh Day was in extraordinary Veneration.

Hence *Sunday*, among the Heathens, is the *Day of the Sun*, which is followed by the *Day of the Moon*, &c. each Day having its Appellation from a Planet, which they imagined, preſided to it; hence if *Saturn* was imagined to preſide to the firſt Hour of *Saturday*, *Jupiter* was likewiſe ſuppoſed to preſide, or influence the ſecond Hour; *Mars* the third, *Sol* the fourth, *Venus* the fifth, *Mercury* the ſixth, the *Moon* the ſeventh; and again, *Saturn* the eighth, the fifteenth, and twenty-ſecond; *Jupiter* the 23d; *Mars* the 24th: So that *Sol* preſided to the firſt Hour of *Sunday*, *Venus* to the ſecond, *Mercury* the third, the *Moon* the fourth, *Saturn* the fifth, *Jupiter* the ſixth, *Mars* the ſeventh, and *Sol* again the eighth, the 15th, the 22d; *Venus* the 23d, *Mercury* the 24th Hour: So that the *Moon* ſhould influence the firſt Hour of the following Day; and thus of all the other Planets and Days of the *Week*. Hence it happened that the Day of *Saturn*, or *Saturday*, is ſucceeded by that of *Sol* which we call *Sunday*, and which is the firſt Day of the *Week*; this is followed by the ſecond, which is the Day of the *Moon*; the third of *Mars*, the fourth of *Mercury*, the fifth of *Jupiter*, the ſixth of *Venus*; and the ſeventh of *Saturn*, called *Sabbath* by the *Jews*.

Dion Caſſius gives for Reaſon of this Denomination, that it being obſerved that the Harmony of the Diateſſaron, which conſiſts in the Ratio of 4 to 3, is of great Force and Effect in Muſick; it was judged meet to proceed directly from *Saturn* to the *Sun*, becauſe there are three Planets between *Saturn* and the *Sun*, and four from the *Sun* to the *Moon*.

From the *Week*, we'll paſs to the *Month*, which is a twelfth Part of the Year; or the Space of thirty Days, or thereabouts, which the *Moon* takes to accompliſh its Courſe. The Days of the *Month* among the *Romans*, to whom, as well as to the *Greeks* (the Uſe of *Weeks* ſeem to have been utterly unknown, before the Eſtabliſhment of the Chriſtian Religion) took their Denomination from the *Calends*, *Nones*, and *Ides*; which Manner of computing, is ſtill practiſed in the Court of *Rome*.

The *Calends* happen the firſt Day of each *Month*. Their Appellation is derived from the *Greek*, καλεω, *Voco*, I call; becauſe that Day the People of *Rome* aſſembled at the Capitol, to learn from the *Pontiffs*, what was to be done during the whole Month, with regard to divine and human Affairs.

The *Greeks* had another Manner of computing their *Months*, viz. from *Neomenia*, or the New *Moon*, for they had no *Calends*; whence, *Suetonius* ſays, in the Life of *Auguſtus*, c. 8. That when that Emperor, was pleaſed to mention ſomething which he thought would never be accompliſhed; he uſed to ſay, that they would be accompliſhed at the *Greek Calends*.

The *Nones* which happened the fifth of the ſeventh Day of the Month, were thus called, either from the Negation *Non*, *no*, becauſe no Divinity was worſhiped in the *Nones*; or as *New*, ſince in thoſe Days the Laws were to be confirmed by a new Promulgation, or, which is more likely, becauſe the *Nones* happened nine Days before the *Ides*.

The *Ides* fall the thirteenth or fifteenth Day of the *Month*, i. e. eight Days after the *Nones*. They are called *Ides*, from the obſolete Word *Iduare*, i. e. *dividere*, to divide, for they divide the *Month* into almoſt two equal Parts; whence *Horace*, *L.* 4. *Ode* 11.

Idus tibi ſunt agendæ
Qui dies menſem veneris marinæ,
Findit Aprilem.

All which the better to inculcate into our Memory, the Schools have compoſed the following *Tetraſtich*.

Maius ſex nonas, October, Julius & Mars:
Quatuor at Reliqui: dabit idus quilibet octo,
Unde dies alios omnes dic ante Calendas,
Quas retro numerans, ſumes a menſe ſequenti.

i. e. The *Month* of *May*, as well as *October*, *July*, and *March*, have ſix Days before the *Nones*; in which, what's done the firſt Day, is ſaid to be done in the *Calends*; what's done the ſecond, is ſaid to be done the ſixth of the *Nones*, then the fifth, fourth, third, and *Pridie Nonas*, or the Day before the *Nones*; laſtly, what's done the ſeventh Day, is ſaid to be done in the *Nones*. The other *Months*, reckon but four Days before the *Nones*; ſo that what's done the firſt Day of thoſe *Months*, is ſaid to be done in the *Calends*. Then follows *Quarto Nonas*, or the fourth of the *Nones*, the third, the *Pridie Nonas*, or Day before the *Nones*, and then *Nonis*, or the *Nones*. In each *Month*, the eight Days after the *Nones* are numbered, or called *ante idus*, or before the *Ides*; ſo that thoſe *Months* which have the *Nones* the fifth Day, have the *Ides* the thirteenth Day; and thoſe which have the *Nones* the ſeventh, have the *Ides* the fifteenth. In thoſe which have the *Nones* the fifth Day, the ſixth Day is called *octavo idus*, or before the *Ides*; and in the others which have the *Nones*, the ſeventh Day, the eighth, is alſo called *octavo idus*, or before the *Ides*.

The other Days after the *Ides*, take their Denomination from the *Calends* of the *Month* following; ſo that if ſomething be done the ſixteenth of *March*, 'tis ſaid to be done the ſeventeenth of the *Calends*, or before the *Calends* of *April*; for in that Number muſt be included, and the very Day of the *Calends*, and the Day in which ſomething is ſaid to be done; whence the ſixteenth of *April*, is called the ſixteenth of the *Calends* of *May*, becauſe *April* has but thirty Days, but *March* thirty one. Therefore to underſtand well this Manner of reckoning the *Months* by *Calends*, *Nones* and *Ides*; we muſt know which *Months* have thirty one Days, and which have but thirty; which can be eaſily retained in our Memory, if we be pleaſed to learn the following Verſes:

April ter denos, Jun, Septemberque, November;
Uno plus Reliqui: viginti Februus octo,
Sed ſi biſſextus fuerit, ſuperadditur unus.

i. e. *April*, *June*, *September*, and *November*, have thirty Days, and other *Months* thirty-one, *February* excepted; which, in the common Years, has but eight and twenty, and nine and twenty in the *Biſſextile* Year.

MONTHS are divided into *Solar* and *Lunar Months*: A *Solar Month*, is the Space of Time, wherein the *Sun* moves through one entire Sign of the *Ecliptick*; hence if Regard be had to the *Sun's* true Motion, the *Solar Months* will be unequal; ſince the *Sun* is longer in paſſing through the Winter Signs, than thro' thoſe of the Summer: But as he conſtantly travels through all the twelve in 365 Days, 5 Hours, and 49 Minutes; the Quantity of a mean *Month* will be had by dividng the Number by 12; on this Principle the Quantity of a *Solar Month*, will be found 30 Days, 10 Hours, 29 Minutes, 5 Seconds.

Lunar Months, are either *Synodical*, *Periodical*, or *illuminative*. *Lunar Synodical Month*, called

alſo abſolutely *Lunar Month*, and *Lunation* is the ſpace of Time between two Conjunctions of the *Moon* with the *Sun*; or between two new *Moons*. The Quantity of the *Synodical Month* is 29 Days, 12 Hours, 44′ 3″ 11‴. *Lunar Periodical Month*, is the Space of Time wherein the *Moon* makes her Round through the *Zodiack*; or wherein ſhe returns to the ſame Point. The Quantity of this *Month* is 27 Days, 7 Hours, 43′ 8″. The antient *Romans* made uſe of *Lunar Months*, and made them alternately of 29 and 30 Days; and, as we have obſerved already, marked the Days of each *Month* by three Terms, viz. *Calends*, *Nones*, and *Ides*. *Lunar illuminative Months*, is the Space from the firſt Time of her Appearance after New *Moon*, to her firſt Appearance after the New *Moon* following. Hence as the *Moon* appears ſometimes ſooner after the New *Moon*, and ſometimes later; the Quantity of the *illuminative Month* is not always the ſame. By this *Month* the *Turks* and *Arabs* go.

There is alſo *Aſtronomical Month*, which is that meaſured by ſome exact Interval, correſponding to the Motion of the *Sun* or *Moon*. Such are the *Solar* and *Lunar Months* abovementioned: But theſe *Months* can be of no uſe in civil Life; where it is required that the *Months* begin and end on ſome certain Day; for this Reaſon Recourſe is had to another Form of *Months*, called *Civil* or *common Months*; which is an Interval of a certain Number of whole Days, approaching nearly to the Quantity of ſome *Aſtronomical*, either *Lunar*, or *Solar Months*. *Civil Months* are various according to the *Aſtronomical Months*, they are accommodated to. For *Civil Lunar Months* are to conſiſt alternately of 29 and 30 Days. Thus will two *Civil Months* be equal to two *Aſtronomical* ones, abating for the odd Minutes; and conſequently the New *Moon* will be hereby kept to the firſt Day of each ſuch *Civil Month*, for a long Time together. However, to make them keep conſtant Pace with the *Civil Months*; at the End of each 948 *Months*, a *Month* of 29 Days muſt be added; or elſe every thirty-third *Month*, muſt conſiſt of 30 Days. This was the *Month* in *Civil*, or common Uſe among the *Jews*, *Greeks*, and *Romans*, till the Time of *Julius Cæſar*. *Civil Solar Months*, are to conſiſt alternately of 30 and 31 Days; excepting one *Month* of the twelve, which for every fourth Year ſhould conſiſt of thirty Days, and the other Years of twenty-nine. This Form of *Civil Months* was introduced by *Julius Cæſar*.

Under *Auguſtus* the ſixth *Month*, till then from its Place called *Sextilis*, was denominated *Auguſtus*, in honour of that Prince, and to make the Compliment yet greater, a Day was added to it. So that it now conſiſted of 31 Days, though till then, it had only contained 30, to make up for which a Day was taken from *February*; ſo that hence forward it only conſiſted of 28 Days, and every third Year of 29; though before it had ordinarily conſiſted of 29 Days, *&c.* and ſuch are the *Civil*, or *Calendar Months* abovementioned, and which now obtain through *Europe*.

Of this Form of *Months* the *Year* is compoſed; and which is a *Cycle* of ſeveral *Months*; uſually twelve.

YEAR, is more properly defined the Space of Time wherein the *Sun* moves, through the twelve Signs of the *Ecliptick*; and produces by its Acceſs to or Receſs from each of the *Tropics*, the annual Variety of the Seaſons, *viz.* the *Spring*, *Summer*, *Autumn*, and *Winter*. This by the Obſervations of *Caſſini*, *Bianchini*, and *de la Hire*, contains 365 Days, 5 Hours, and 49 Minutes; which is the Quantity of the *Year* aſſumed by the Authors of the *Gregorian Calendar*. So that the *Sun* moves every Day, through 59 Minutes and 8 Seconds of a Degree.

But in the *Civil* or *Popular* Account, this *Year* only contains 365 Days; except every fourth, which contains 366. This *Year* is called *Solar*, which is either *Aſtronomical* or *Civil*.

The *Solar Aſtronomical Year* is determined preciſely by the Obſervations of *Aſtronomy*, and is of two Kinds, *Tropical*, and *Siderial* or *Aſtral*. The *Tropical* or *natural Year* is the Time, as before obſerved, which the *Sun* employs in paſſing through the *Zodiack*. *Siderial*, or *Aſtral Year*, is the Space of Time wherein the *Sun*, going from any fixed *Star*, returns to the ſame. This conſiſts of 365 Days, 6 Hours, 10 Minutes.

Civil Year, is that Form of *Year* which each Nation has contrived to compute Time by; or the *Civil* is the *Tropical Year*, conſidered as only conſiſting of a certain Number of whole Days; the odd Hours and Minutes being ſet aſide, to render the Computation of Time in the common Occaſions of Life more eaſy. Hence as the *Tropical Year* is 365 Days, 5 Hours, 49 Minutes, the *Civil Year* is 365 Days. And hence alſo as it is neceſſary to keep Pace with the Heavens, it is required that every fourth *Year* conſiſts of 366 Days; which makes the *Civil Year* to be either *Common*, or *Biſſextile*.

The *Common Civil Year*, is that conſiſting of 365 Days; and the *Biſſextile*, or *Leap Year*, that of 366 Days; or which has a Day extraordinary, which Day is called *intercalary*, or *Biſſextile* Day. *Julius Cæſar* to make the *Civil Year* keep Pace with the *Tropical* one, was the firſt who appointed this *intercalary* Day, by contriving that the ſix Hours which the former came ſhort of the latter, ſhould in four *Years*, make a whole Day, and be added after the twenty fourth of *February*, which was their ſixth of the *Calends* of *March*. Hence as in that *Year*, they reckoned this Day twice over, or had *bis ſexto Calendas*, the *Year* itſelf came to be called *biſſextus*, and *Biſſextile*. The *intercalary* Day, however, among us, is not got in by telling the twenty fourth of *February* twice over; but by adding a Day after the twenty-eighth of *February*, which *Month*, that *Year*, comes to contain twenty-nine Days.

The *Lunar Year*, is a Syſtem of twelve *Lunar Months*; hence from two Kinds of *Synodical Lunar Months*, there ariſe two Kinds of *Lunar Years*; the one *Aſtronomical*, the other *Civil*. The *Lunar Aſtronomical Year*, conſiſts of twelve *Lunar Synodical Months*; and therefore contains 354 Days, 8 Hours, 48 Minutes, 38 Seconds, 12 Thirds. *Lunar Civil Year* is either *Common* or *Emboliſmick*. The *Common* conſiſts of twelve *Lunar Civil Months*; and therefore contains 354 Days. The *Emboliſmick*, or *intercalary*, conſiſts of thirteen *Lunar Civil Months*.

Note, As the Difference between the *Common Lunar Civil* YEAR, and the *Tropical Year* is 11 Days, 5 Hours, and 49 Minutes; to have the former keep Pace with the latter, there are 34 Months of thirty Days, and four Months of 31 Days each, to be inſerted in every *Lunar Year*; which ſtill leave behind them an Appendix of 4 Hours, 21 Minutes; which in ſix Centuries make nearly a Day more.

Thus far we have conſidered *Years*, with a View to the Principles of *Aſtronomy*, whereon the Diviſion is founded. By this the various Forms of *Civil Years*, that have antiently obtained, or ſtill do obtain, in divers Nations, are to be examined; beginning by the antient *Roman Year*, which was a *Lunar Year*; and which, as firſt ſettled by *Romulus*, only conſiſted of ten Months; viz. *March*, the firſt, containing 31 Days; *April* 30, *May* 31, *June* 30. *Quintilis* 31. *Sextilis* 30. *September* 30, *October* 31, *November* 30, *December* 30; in all 304 Days; which came ſhort of the true *Lunar Year* by 50 Days, and of the *Solar*, by 61 Days. Hence the Beginning of *Romulus*'s *Year* was vague and unfixed to any preciſe Seaſon; which Inconvenience to remove, that Prince ordered ſo many Days to be added yearly, as would make the State of the Heavens correſpond to the firſt Month, without incorporating theſe additional Days, or calling them by the Name of any Month. He conſecrated the firſt of his ten Months to *Mars*, whence its Appel-

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Appellation *March*, the ſecond to *Venus*, &c. as we learn it from *Ovid*, *Lib.* 1. *Faſt.* in the following Verſes:

Martis erat primus menſis, Veneriſque ſecundus.
Hæc generis Princeps; ipſius ille Pater.
Tertius à ſenibus; Juvenum de nomine quartus;
Quæ ſequitur numero turba notata ſuo eſt.

Numa Pompilius corrected this irregular Conſtitution of the *Year* by *Romulus*, and compos'd two new Months, *January* and *February*, of the Days that were us'd to be added to the former *Year*; the firſt was inſtituted in Honour of *Janus*, and the ſecond in Honour of *Februus*, the God of Luſtration. Hence *Ovid*, in the Book abovementioned,

At Numa nec Janum, nec avitas præterit umbras;
Menſibus antiquis, præpoſuit que duos.

Thus *Numa*'s *Year* conſiſted of 12 Solar Months, which he adjuſted to ſo many Lunar Months; 6 of them being of 30 Days, and the other 6 of 29 Days, in all 354 Days.

But as in this Number of Days the entire Revolution of the Sun could not be accompliſh'd, *Julius Cæſar* thought proper to have 11 Days and 6 Hours added to it, and thereby made the *Year* to conſiſt of 365 Days, and 6 Hours, beginning it at the Month of *March*; which *Year* was call'd, from his Name, *Julian Year*. The Months thereof ſtood thus, *January*, 31 Days; *February*, 28; *March*, 31; *April*, 30; *May*, 31; *June*, 30; *July*, (call'd before *Quintilis*, becauſe the 5*th* Month; but at that Time of the Reformation of the *Calendar* by *Julius Cæſar* call'd *Julius*, by a Law made under the Conſulſhip of *Mark Anthony*) 31; *Auguſt*, 31; *September*, 30; *October*, 31; *November*, 30; *December*, 31.

Julius Cæſar was aſſiſted in the Contrivance of this Form of *Year*, by *Soſigenes*, a famous Mathematician, call'd over from *Egypt* for this very Purpoſe; who, to ſupply the Defect of 67 Days, which had been loſt thro' the Fault of the *Pontifices*, and to fix the Beginning of the *Year* to the *Winter Solſtice*, made that *Year* to conſiſt of 15 Months, or 445 Days; which, for that Reaſon, is us'd to be call'd *Annus Confuſionis*, the *Year of Confuſion*.

The *Egyptians* had alſo their *Year* call'd *Nabonaſſar*, and which is a *Solar Year* of 365 Days divided into 12 Months, of 30 Days each, beſides five intercalary Days added at the End. The Names of thoſe Months are, 1. *Thot*; 2. *Paophi*; 3. *Athyr*; 4. *Chojac*; 5. *Tybi*; 6. *Mecheir*; 7. *Phamenoth*; 8. *Pharmuthi*; 9. *Pachon*; 10. *Pauni*; 11. *Epiphi*; 12. *Meſori*; beſides the ημεραι επαγομεναι. Hence, as the *Egyptian Year*, in every four Years, loſes a whole Day of the *Julian Year*, its Beginning, in the Space of 460 *Years*, runs thro' every Part of the *Julian Year*; which Space elaps'd, they meet again. This *Year* is us'd by *Ptolemy* in his *Almageſt*; ſo that the Knowledge thereof is of Uſe in Aſtronomy, for comparing the antient Obſervations with the modern.

Diodorus Siculus, *Lib.* 1. *Plutarch*, in the Life of *Numa*, and *Pliny*, *Lib.* 7. *c.* 48. informs us, that the antient *Egyptians* meaſur'd their *Years* by the Courſe of the *Moon*. At firſt they were only one Month, then three, then four, like that of the *Arcadians*; and then ſix, like that of the People of *Acarnania*. Thoſe Authors add, that it is on this Account they reckon ſuch a vaſt Number of *Years* from the Beginning of the World; and that in the Hiſtory of their Kings we meet with ſome who liv'd 1000, or 1200 *Years*. But *Herodotus* is ſilent on this Point; he only obſerves, that the *Egyptian Year* conſiſted of 12 Months, as we have above repreſented it. Beſides, we learn from Scripture, that from the Time of the Flood, the *Year* was compos'd of 12 Months; *Cham*, conſequently, and his Son *Miſraim*, the Founder of the *Egyptian Monarchy*, muſt have had that Cuſtom; and it is no way probable his Deſcendants ſhould alter it. Add, that *Plutarch* ſpeaks of it with a deal of Uncertainty, and as no more than a Report; and *Diodorus Siculus* as only a Conjecture of I know not what Author's, whom he does not name; and who, in all Probability, might have fram'd this *Hypotheſis* to reconcile the *Egyptian* Chronology with that of ſome other Nations. F. *Kircher*, however, maintains, that, beſides the *Solar Year*, there were ſome of the Names or Cantons of *Egypt*, who us'd a *Lunar* one; and that in the remoteſt Ages there were ſome who took a Revolution of the Moon, that is, a Month for a *Year*; and others, who finding the *Year* too ſhort, made it two Months, others three, others four, *&c.*

A late Author obſerves, that *Varro* has affirm'd of all Nations what we have here quoted of the *Egyptians*; and adds, that *Lactantius* takes him to Taſk on that Subject. We do not know in what Places of *Varro*, or of *Lactantius*, he has ſeen this; all we can ſay, is, that *Lactantius*, *Divin. Inſt. Lib.* 2. *c.* 13. where he gives *Varro*'s Opinion, only repreſents him as ſpeaking of the *Egyptians*. However, St. *Auguſtine*, *De Civit. Dei*, *Lib.* 15. *c.* 14. ſhews, that the *Years* of the Patriarchs, mention'd in Scripture, are like ours, and not one of ours equal to ten of theirs, as it appears had been the Opinion of ſome People.

Upon the *Egyptians* being ſubdu'd by the *Romans*, they receiv'd the *Julian Year*, tho' with ſome Alteration; for they ſtill retain'd their antient Months, with the five ημεραι επαγομεναι, and every fourth *Year* anſwer'd to the 29*th* of *Auguſt* of the *Julian Year*. This *Year*, thus reform'd, was call'd *Annus Actiacus*, as being inſtituted before the Battle of *Actium*.

The *Year* of the antient *Greeks* was *Lunar*, conſiſting of 12 Months, which at firſt were 30 Days apiece; then alternately 30 and 29 Days, computed from the firſt Appearance of the *New Moon*, with the Addition of the *emboliſmick Month* of 30 Days, every 3*d*, 5*th*, 8*th*, 11*th*, 14*th*, 16*th* and 19*th Year* of a Cycle of 19 *Years*; in order to keep the *New* and *Full Moons* to the ſame Term of Seaſons of the *Year*. Their *Year* commenc'd at the *Full Moon* next after the *Summer Solſtice*; the Order, *&c.* of their Months, was thus: 1. Εκαλομβαιων, containing 29 Days. 2. Μεταγειτνιων, 30. 3. Βοηδρομιων, 29. 4. Μαιμακτηριων, 30. 5. Πυανεψιων, 29. 6. Ποσειδεων, 30. 7. Γαμηλιων, 9. 8. Ανθεστηριων, 30. 9. Ελαφηβολιων, 29. 10. Μυνυχιων, 30. 11. Θαργηλιων, 29. 12. Σκιρροφοριων, 30.

The *Macedonians* had other Names for their Months, ſo had the *Syro-Macedonians*, *Smyrnæans* and *Tyrians*; ſo alſo the *Cypriots*, *Paphians*, and ſo the *Bithynians*, &c.

The *Macedonian Year* is divided into *antient* and *modern*. The *antient Macedonian Year* is a *Lunar Year*, only differing from the *Attic*, in the Names and Order of the Months; the firſt *Macedonian* Month agreeing with the *Attic Mæmacterion*. The *modern Macedonian Year* is a *Solar Year*, whoſe Beginning is fix'd to the firſt of *January* of the *Julian Year*, with which it perfectly agrees. This *Year* was particularly call'd the *Attic Year*.

The *Jewiſh Year* is alſo divided into *antient* and *modern*. The *antient Jewiſh Year* is a *Lunar Year*, conſiſting commonly of 11 Months, which alternately contain 30 and 29 Days. It was made to agree with the *Solar Year*, either by the adding of 11, and ſometimes 12 Days, at the End of the *Year*, or by an *emboliſmick* Month. The Names and Quantities of the Months ſtand thus: 1. *Niſan*, or *Abib*, 30 Days. 2. *Jiar*, or *Zius*, 29. 3. *Siban*, or *Scivan*, 30. 4. *Thamuz*, or *Tamuz*, 29. 5. *Ab*, 30. 6. *Elul*, 29. 7. *Tiſri*, or *Ethanim*, 30. 8. *Marcheſvam*, or *Bul*, 29. 9. *Ciſleu*, 30. 10. *Tebeth*, 29. 11. *Sabat*, or *Schebeth*, 30. 12. *Adar*, in the *emboliſmick Year*, 30. *Adar*, in the common *Year*, was but 29.

Note, That in the *defective Year* CISLEU was only 29 Days; and in the *redundant Year* MARCHESVAM was 30.

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The *modern Jewiſh Year* is likewiſe *Lunar*, conſiſting in common *Years* of 12 Months, but of 13 in *emboliſmick Years*, which in a Cycle of 19 *Years* are the 3*d*, 6*th*, 8*th*, 11*th*, 14*th*, 17*th* and 19*th*. Its Beginning is fix'd to the *New Moon* next after the *autumnal Equinox*. The Names, &c. of the Months, are, 1. *Tiſri*, containing 30 Days. 2. *Marcheſvam*, 29. 3. *Ciſleu*, 30. 4. *Tebeth*, 29. 5. *Shebeth*, 30. 6. *Adar*, 29. 7. *Veadar*, in the *emboliſmick Year* 30. 8. *Niſan*, 30. 9. *Jiar*, 29. 10. *Sivan*, 30. 11. *Thamuz*, 29. 12. *Ab*, 30. 13. *Elul*, 29.

The *Syrian Year* is a *Solar Year*, having its Beginning fix'd to the Beginning of *October* in the *Julian Year*, from which it only differs in the Name of the Months, the Quantities being the ſame as follows: 1. *Tiſhrim*, anſwering to our *October*, and containing 31 Days. 2. *Latter Tiſhrim*, containing, like our *November*, 30. 3. *Canun*, 31. 4. *Latter Canun*, 31. 5. *Shabat*, 28. 6. *Adar*, 31. 7. *Niſan*, 30. 8. *Ayiar*, 31. 9. *Haziram*, 30. 10. *Tamuz*, 30. 11. *Ab*, 31. 12. *Elul*, 30.

The *Perſian Year* is likewiſe a *Solar Year*, of 365 Days, conſiſting of 12 Months of 30 Days each, with 5 intercalary Days added at the End. The Months are as follows: 1. *Aſrudia Meh.* 2. *Ardihaſcht Meh.* 3. *Cardi Meh.* 4. *Thir Meh.* 5. *Merded Meh.* 6. *Schabarir Meh.* 7. *Mehar Meh.* 8. *Aben Meh.* 9. *Adar Meh.* 10. *Di Meh.* 11. *Behen Meh.* 12. *Affirer Meh.* This *Year* is call'd the *Yezdegerdick Year*, to diſtinguiſh it from the fix'd *Soler Year* call'd the *Galalean Year*, which the *Perſians* began to uſe in the *Year* 1079, and which was form'd by an Intercalation made ſix or ſeven Times in four *Years*, and then once every fifth *Year*. It may be obſerv'd, that the *yezdegerdick Year* is the ſame with *Nabonaſſar's Year*. As to the *Galalean Year*, it is abſolutely the beſt, and juſteſt, of all the *civil Years* yet invented, as being found by Calculation to keep the *Solſtices* and *Equinoxes* preciſely to the ſame Days, and anſwering very accurately to the *Solar* Motions.

The *Arabick* and *Turkiſh Year* is a *Lunar Year*, conſiſting of 12 Months, which contain, alternately, 30 and 29 Days; tho' ſometimes it contains 13 Months; the Names, &c. whereof are as follows: 1. *Muharram*, containing 30 Days. 2. *Saphar*, 29. 3. *Rabia*, 30. 4. *Latter Rabia*, 29. 5. *Jomada*, 30. 6. *Latter Jomada*, 29. 7. *Rajub*, 30. 8. *Shaaban*, 29. 9. *Samadan*, 30. 10. *Shawal*, 29. 11. *Dulkaadah*, 30. 12. *Dulheggia*, 29; and in the *emboliſmick Year* 30. An intercalary Day is added every 2*d*, 5*th*, 7*th*, 10*th*, 13*th*, 15*th*, 18*th*, 21*ſt*, 24*th*, 26*th* and 29*th*, in a Cycle of 29 *Years*.

The *Ethiopick Year* is a *Solar Year*, perfectly agreeing with the *Actiack*, except in this, that the Names of the Months are different. It commences with the *Egyptian Year*, on the 29*th* of *Auguſt* of the *Julian Year*. Its Months are, 1. *Maſcaram*. 2. *Tykympt*. 3. *Hydar*. 4. *Tyſhas*. 5. *Tyr*. 6. *Jacatit*. 7. *Magabit*. 8. *Migaria*. 9. *Ginbat*. 10. *Syne*. 11. *Humle*. 12. *Habaſe*. Intercalary Days 5.

The *Jews* us'd to give to one of their *Years* the Name *Sabbatic*, *Annus Sabbaticus*, which was every 7*th Year*; during which, they let their Land lie at Reſt. Every 7*th Sabbatic Year*, *i. e.* every 49*th Year*, was call'd the *Year* of *Jubilee*, and was held with extraordinary Solemnity.

The Day wherein the *Year* commences, has been as different, in the different Nations above-mention'd, as the *Year* it ſelf; and yet, in all, held in great Veneration.

The *Romans*, as we have obſerv'd already, began their *Year* at the Month of *March*, and conſecrated the firſt and laſt Day of the *Year* to *Janus*; for which Reaſon, they repreſented him with two Faces. From them we have learn'd the Ceremony of wiſhing a *happy New Year*; for, before the laſt Day was ſpent, they not only viſited and complimented each other, but alſo preſented *Strenæ*, in *French Eſtrenes*, or *New-Year's Gifts*, and offer'd Vows to the Gods for the Preſervation of each other. *Lucian* repreſents it as a Practice of a very antient Standing, even in his Time, and refers it to *Numa*. The antient Lawyers derive the Word hence, that theſe Preſents were only given *viris ſtrenuis*; *Symmachus* adds, that the Uſe hereof was firſt introduc'd by King *Tatius*, *Romulus*'s Collegue, who receiv'd Branches of Vervain, gather'd in the ſacred Grove of the Goddeſs *Strenia*, as a happy Preſage of the Beginning of the *Year*.

Antiently a Pound of Gold was given to the Emperors every *New-Year's Day*, by way of *Strena*. *Du Cange* obſerves, that *Strina*, or *Strinna*, denoted a Kind of Tribute which the People of *Dalmatia*, or *Croatia*, paid to the *Venetians*, or to the Kings of *Hungary*, whom they obey'd voluntarily.

The *Jews*, as moſt of the other Nations of the Eaſt, had a *Civil Year*, which commenc'd with the *New Moon* in *September*; and an *Eccleſiaſtical Year*, which commenc'd from the *New Moon* in *March*.

The *French Year*, during the Reigns of the *Merovingians*, or firſt Race of their Kings, began on the Day wherein the Troops were review'd, which was the firſt Day of *March*. Under the *Carlovingians*, or ſecond Race, it began on *Chriſtmas-Day*. And under the *Capetians*, or third Race, (which is the preſent Race) on *Eaſter-Day*; which, therefore, varied between the 22*d* of *March*, and the 25*th* of *April*; and this is ſtill the Beginning of the *French Eccleſiaſtical Year*. But for the *Civil*, *Charles* IX. appointed, in 1564, that, for the future, it ſhould commence on the firſt Day of *January*.

The *Civil*, or *Legal Year*, in *England*, commences on the Day of the Annunciation, *i. e.* on the 25*th* Day of *March*; tho' the *Hiſtorical Year* begins on the Day of the Circumciſion, *i. e.* the firſt of *January*; on which Day the *German* and *Italian Year* alſo begins. *Stow* obſerves, that *William the Conqueror* having been crown'd the firſt of *January*, it thenceforth became the firſt Day of the *Year* for Hiſtorians, &c. tho' in all civil Affairs they retain'd the antient Manner of accounting, which began with the 25*th* of *March*. The Part of the *Year*, between thoſe Terms, is uſually expreſs'd both Ways, as 174-$\frac{1}{2}$. Since the Conqueror, the King's Patents, Charters, Proclamations, &c. are uſually dated by the *Year* of the King's Reign. The Church, as to her ſolemn Service, begins the *Year* on the firſt *Sunday* in *Advent*, which is always that next St. *Andrew*'s Day, or the 30*th* of *November*.

The *Mahometans* begin their *Year* the Minute the Sun enters *Aries*; the *Perſians*, in the Month anſwering to our *June*; the *Chineſe*, and moſt of the *Indians*, begin it with the firſt Moon in *March*; the *Brachmans* begin it with the New Moon in *April*, on which Day they hold a Feaſt call'd *Samwat Saradi pauduga*, *q. d.* Feaſt of *New-Year's Day*. The *Mexicans*, according to *D'Acoſta*, begin the *Year* on our 23*d* of *February*, when the Leaves begin to grow green. Their *Year* conſiſts of 18 Months, 20 Days each; which making 360 Days, the remaining five Days are ſpent in Mirth, and no Buſineſs ſuffer'd to be done, nor even any Service at the Temples. *Alvarez* relates almoſt the ſame of the *Abyſſinians*, who begin their *Year* on the 26*th* of *Auguſt*, and have five idle Days at the End, which they call *Pagomen*. The *Greeks* begin their *Year* of the World from the firſt of *September*.

As we have heretofore obſerv'd that the *Julian Year* conſiſts of 365 Days, and 6 Hours, and the *Biſſextile* of 366; hence it follows, that the *common Year* conſiſts of 52 Weeks, and 1 Day, and the *Biſſextile* of 52 Weeks, and 2 Days: Therefore if the *common Year* begins on *Sunday*, the Beginning of the following *Year* will fall on a *Monday*; but if the *Year* be *Biſſextile*, the Beginning of the following *Year* will fall on a *Tueſday*: Therefore if the ſeven Days of the Week be mark'd, in the *Calendar*, with the Letters *A*, *B*, *C*, *D*, *E*, *F*, *G*, and the Letter *A* indicates the firſt Day of *January*, as it really does; the ſame Letter will not every *Year* indicate *Sunday*. However, if *A* be the *Dominical Letter* of ſome common *Year*,

Year, i.e. if the first Day of *January* of that *Year* be a *Sunday*, because, the *Year* following, *January* will begin on *Monday*; the Letter *A*, which is always affix'd to the first Day of *January*, will that *Year* indicate *Monday*, and consequently the Letter *B Tuesday*, *C Wednesday*, &c. so far as the Letter *G*, which will be the *Dominical Letter*, then *F*, &c. so that by a retrograde Order, or going backward, after seven *Years* it will happen again to be the Turn of the Letter *A*; only this Cycle be otherwise interrupted. But because from the Time of the *Julian* Correction there is an *Intercalation* every *4th* Year, nor the Order of the Letters can entirely happen the same before the *Bissextile* has fell on every Letter; hence, a *Cycle of the Sun*, or *Solar Cycle*, or a Revolution of 28 *Years*, beginning with 1, and ending with 28; which Number proceeds from 7 Times 4; for in the *Bissextile* there are two *Dominical Letters* of the same Year, the first from the *Calends* of *January* to the Feast of St. *Matthias*, which happens the *25th* of *February*; the other from that same Feast to the End of the *Year*.

That Space of 28 *Years*, as well in the *Julian* as in the *Gregorian Calendar*, is call'd the *Solar Cycle*, because *Sunday*, design'd by the *Dominical Letter*, was antiently call'd the Day of *Sol*, or of the Sun, and not with Regard to the Sun's Course, which has nothing to do herein.

Therefore to find the *Dominical Letter* for every *Year*, in the Tables computed for that Purpose, there must be found, first, the *Solar Cycle*, adapted to that *Year*, and from the Place of that Number in the Tables there will occur the *Dominical Letter*.

To find the *Cycle of the Sun* for any *Year* given, we must add 9 to the Number given, and divide the Sum by 28; the Number remaining will be the Number of the *Cycle*, and the Quotient the Number of Revolutions since *Christ*. If there be no Remainder, it will be the *28th*, or last *Year* of the *Cycle*.

Junge annis Domini tres Ternos, perque vigenti
Octo seca summam; Cyclus Solaris habetur.

For Example; if 9 be added to the *Year* 1700, 'twill make 1709; which Sum being divided by 28, will give in the Quotient 61, and the Remainder will be 1; whence the *Year* 1700 is the first of the *Solar Cycle*.

CYCLE *of the* Sun *in* Julian Years.

1	G F	5	B A	9	D C	13	F E	17	A G	21	C B	25	E D
2	E	6	G	10	B	14	D	18	F	22	A	26	C
3	D	7	F	11	A	15	C	19	E	23	G	27	B
4	C	8	E	12	G	16	B	20	D	24	F	28	A

CYCLE *of the* Sun *from the* Gregorian Year 1700, *to the* Year 1800.

1	D C	5	F E	9	A G	13	C B	17	E D	21	G F	25	B A
2	B	6	D	10	F	14	A	18	C	22	E	26	G
3	A	7	C	11	E	15	G	19	B	23	D	27	F
4	G	8	B	12	D	16	F	20	A	24	C	28	E

But as the Tables of the *Calendar* are often erroneous, there is another Method of finding the *Dominical Letter*, *viz.* by an artificial Distich, each Diction whereof answers to each Month of the Year, and to their initial Letters, denoting the Letters by which each Month begins; and which is as follows:

Astra dabit Dominus, gratisq; beabit Egenos,
Gratia Christicolæ feret aurea dona fideli.

The Expression *Astra*, which begins with *A*, denotes that the first Day of the first Month, or of *January*, is also to be design'd by the Letter *A*; therefore the second is mark'd with the Letter *B*, the third with *C*, *&c.* in that Manner as *A* returns to the *8th* Day, as also to the *15th*, *22d*, *29th*; therefore the *30th* is mark'd with the Letter *B*, and the *31st* with the Letter *B*; whence the Letter *D* will be affix'd to the first Day of *February*, which is to answer the Word *dabit*; and thus of the others.

There are two other *Cycles*, besides the *Solar*, *viz.* the *Lunar Cycle*, and the *Cycle of Indictions*.

The LUNAR CYCLE, or *Cycle of the Moon*, (called also the *Golden Number*, because antiently painted in golden Characters) is a Period of 19 Solar Years, equivalent to 19 Lunar Years, and 7 intercalary Months; in which Time the New and Full Moons are suppos'd to return to the same Day of the *Julian* Year.

But this Equation cannot be very well understood without observing, first, that as the Sun takes a whole Year to accomplish his Course in the Zodiack; the Moon, on the contrary, perfects her's in a Month. Tho', as we have heretofore observ'd, there be two Sorts of Lunar Months, *viz.* a *periodical* one, in which the Moon returns to the same Point of the Zodiack whence she had parted; and the other *synodical*, in which she returns from one Conjunction with the Sun to the other. The first is said to consist of 27 Days, 7 Hours, and 43 Minutes; and the last, which is a great deal better adapted to the different Phases of the Moon, and which is the common Lunar Month, contains 29 Days, 12 Hours, 44 Minutes, 3 Seconds, *&c.*

But this *synodical Month* is also divided into two; one call'd *astronomical*, and which, as we have said already, consists of 29 Days, 12 Hours, 44 Minutes, and 3 Seconds; and which is the only one to be us'd in astronomical Calculations, *v. gr.* to discover the New Moons, Full Moons, and Eclipses; and the other civil, commonly us'd in the civil Life, and which, without any Regard to Fractions, or Minutes, is not compos'd of 29 Days, and 12 Hours, but of whole Days, so as to consist alternately of 29 and 30 Days; therefore those 12 Hours remaining, in each *Lunation*, or the monthly Period of the Moon, make up a whole Day, in two *Lunations*. One of these *Lunations* is call'd *plain*, because consisting of 30 Days; and the other *cava*, or *hollow*, because but of 29 Days; and both *Lunations* together contain 59 Days.

But as there are 44 Minutes, or almost three Quarters of an Hour, remaining in each Lunation. they can be thus collected, as to make up a Day within 32 Lunations; which Day must be added to the *cava*, or *hollow*, or 29 Days Lunation, which will make the civil Lunations agree with the astronomical.

Of these Lunations, or Lunar Months, may be compos'd entire Lunar Years, such as those in Use among the *Turks*, or mix'd with Solar Years, as invented by *Meton* the *Athenian*; whose Hypothesis, or Lunar Cycle, we'll explain in the following Manner:

If we admit each Year to consist of 365 Days, nineteen Years must contain 6935 Days; but as within 19 Years there happens but four of them Bissextile, and three Times six Hours, there must be contain'd in the Course of those Years, 6939 Days, and 18 Hours.

Besides, there are but twelve Lunar Months in each Lunar Year, six of which are *plain*, and contain 30 Days;

Days; and ſix *hollow*, which contain but 29 Days, and which added together, make up, every Year, 354 Days.

There remain, beſides, every Year, 11 Days, which, at the End of three Years, produce 33 Days, and conſequently form a Month of 30 Days, with 3 Days more; whence there are in that Year 13 *Lunations*, *viz.* 12 common, and 1 *emboliſmick*, or intercalary; and that Year is call'd *emboliſmick Year*.

Therefore, if 354 be taken 19 Times, they'll give 6726 Days; likewiſe, 19 Times 11, will give 209, there are, beſides, 4 *biſſextile* Days, and 18 Hours, which Sums, 6726, 209, 4 Days, 18 Hours, being added together, will produce the Sum 6939 Days, and 18 Hours; which Number is found in 19 Solar *Julian Years*.

The firſt Sum, 6726, is divided into 228 common Months, *viz.* 114 *full* Months, and 114 *hollow* Months. The ſecond Sum, 209, will give 7 *emboliſmick* Months; the firſt 6 whereof will be of 30, and the *7th* of 29 Days: Moreover, the 4 *biſſextile* Days are inſerted in their proper Places, in the Lunar, as in the Solar Years, and in both the Lunar and Solar there remain 18 Hours; whence, in the Space of 19 Years, there happen 235 *Lunations*, which contain as many Days as there are in 19 Solar Years, according to the *Julian Hypotheſis*, and the *Metonick Equation*.

Altho' the *Metonick* Cycle, when firſt render'd publick by its Author, was found agreeable to the Doctrine of Time, and for that Reaſon was inſerted into the antient *Calendar*, (a little after the Celebration of the Council of *Nice*) to indicate the *New* and *Full Moons*; it was, notwithſtanding, afterwards found erroneous, and that it wanted to be corrected.

But, however, as the Beginning of that *Cycle* had been arbitrary, if we reckon backward every 19*th* Period, we'll find, that the firſt Year of the *Chriſtian* Æra will fall in the ſecond Year of the Cycle of 19 Years; therefore if 1 be added to the Year of the *Chriſtian* Æra, and the Sum be divided afterwards by 19, the Remainder will ſhew the Number of the Lunar Cycle for that Year. For Example, if 1 be added to the Year 1700, we have 1701; which Sum, if divided by 19, will produce in the *Quotient*, or *Exponent*, 89, and 10 will remain; whereby the Year 1700 will appear to be the 10*th* of the Cycle.

Unum addes annis Domini, ſummamque novenis
Et deris tribues, numerus tibi ut aureus adſit.

The *Cycle of Indictions* is a Series of 15 Years, returning conſtantly round, like the other Cycles, and commencing from the 3*d* Year before *Chriſt*. When this *Cycle of Indictions* was firſt ſet on Foot among the *Romans*, and for what End, is much controverted among Chronologers. *Petavius* leaves it as a Thing not to be aſcertain'd. The moſt probable Opinion is, that it was receiv'd about the Year 312, after the Time of *Conſtantine*.

To find the *Cycle of Indictions* for any Year given; add 3 to the given Year, and divide the Sum by 15, the Remainder is the *Cycle of Indictions*. If there be no Remainder, the *Indiction* is 15.

Si tribus adjunctis Domini diviſeris annos
Ter tibi per quinos, Indictio certa patebit.

The Origin of *Cycles* was thus: The apparent Revolution of the Sun round the Earth has been divided arbitrarily into 24 Hours; the Baſis, or Foundation of all our Menſuration of Time. Civil Uſe knows none but Hours, or rather Multiples of Hours, as Days and Years; but neither the annual Motion of the Sun, nor that of the other heavenly Bodies, can be meaſur'd exactly, and without any Remainder, by Hours, or their Multiples: That of the Sun, *v. gr.* is 365 Days, 5 Hours, 49 Minutes, nearly; that of the Moon 29 Days, 12 Hours, 44 Minutes: Hence, to ſwallow up theſe Fractions in whole Numbers, and yet in Numbers which only expreſs Days and Years, *Cycles* have been invented; which comprehending ſeveral Revolutions of the ſame Body, re-place it, after a certain Number of Years, in the ſame Point of the Heavens whence it firſt departed; or, which is the ſame Thing, in the ſame Place of the *civil Calendar*.

Of the three *Cycles*, Solar, Lunar, and of Indiction, abovemention'd and explain'd, was form'd that famous Period, commonly call'd the *Julian Period*, becauſe adapted by its Author, *Joſeph Scaliger*, *Julius*'s Son, to the Method and *Cycles* of the *Julian* Year. For if you carry the Solar *Cycle* 28, into the Lunar *Cycle* 19, the Product will be 532, which is the *Victorian Period*, thus call'd from one *Victor*, its Author, born in *Aquitain*, and which was compos'd at the Intreaties of Pope *Hilary*, and afterwards made Uſe of by *Dionyſius Exiguus* to reconcile the *Chriſtians* of the Weſt with thoſe of *Alexandria*, with Regard to the Celebration of the Feaſt of *Eaſter*, which, towards the Beginning of the 6*th* Century, had occaſion'd a very great Difference between them: Which *Victorian Period* was afterwards receiv'd by the unanimous Conſent of both Churches, till the Reformation made under Pope *Gregory* XIII.

If the *Victorian*, or *Dionyſian Period*, 532, be again multiplied by the *Cycle* of *Indiction*, 15, they'll produce 7980; ſo that if that Number be divided by 28, by 19, or by 15, there will be no Remainder after the Diviſion. This Period has this peculiar to it ſelf, that within 7980 Years there could not be found two Years which ſhould chance to have theſe three Cycles ſemblable; ſo that if our Annaliſts had took the Pains to mark the Cycles of every Year, they had avoided that Ambiguity in the Chronology which renders it confus'd, and often unintelligible.

But as theſe Cycles were not known before the Birth of *Chriſt*, hence it happens, that the *Julian Period* has not produc'd thoſe ſignal Advantages which otherwiſe could have been expected from it. It has, however, this great one, of being the common Meaſure of Time, the leaſt controverted which can be made Uſe of by Chronologers, of what Denomination or Opinion ſoever; which can be evidenc'd by a ſingle Example: *V. gr.* Almoſt all Chronologers diſagree, with reſpect to the Beginning of the World; for ſome of them will have it to have been form'd 4000 Years before the Birth of *Chriſt*, others more, and others leſs; whence, tho' they all agree in the Enumeration of the ſubſequent Years, there is a Difference which proceeds from the Beginning, and which could never be yet terminated among them: Therefore it was very reaſonable to endeavour to find out a *Period*, which, being confin'd to no Circumſtances, could be adapted to every Hypotheſis, or Syſtem of Chronologers.

Thus they all agree, with reſpect to the *Chriſtian Æra*, and all confeſs that the Year of the *Gregorian* Reformation is 1582 of the common *Æra*; but if the firſt Year of the *Chriſtian Æra* be the next following Year after that in which *Chriſt* was born, or if it be rather the fifth Year after the Birth of *Chriſt*, is what they ſeem to be dubious of.

However, it appears, by a retrograde Numeration, that the tenth Year of the Solar Cycle, the ſecond of the Lunar, or of the Golden Number, and the fourth of the Indiction, are to be attributed to the firſt Year of the *Chriſtian Æra*. Therefore, if in the *Julian Period* of 7980 Years, we deſire to know to which the Solar Cycle 10, the Golden Number 2, and the Indiction 4, might be more properly adapted, none will be found but 4714; becauſe that ſole Number, diſtributed in the whole *Period* by 28, without minding the Quotient, leaves 10; divided by 19, leaves 2; and by 15, leaves 4: Therefore the firſt Year of the *Chriſtian Æra* anſwers to the Year 4714 of the *Julian Period*, and conſequently the Year of *Chriſt* 1700, is 6413 of the *Julian Period*; and the firſt Year of the World will fall on the Year 710 of the ſame

ſame *Period*. If then, which is the more certain Opinion, the Day of *Chriſt*'s Nativity be referr'd to the latter End of the 4000*th* Year of the World, and precedes by four Years the Beginning of the common *Æra*; likewiſe, if to the Number 4713 of the *Julian Period*, by which is denoted the Year next preceding the Beginning of the *Chriſtian Æra*, we add the Year 1700 of that *Æra*, which begins from the Year 4714 of the ſame *Period*, we perfect the Sum 6413; but if we take off 4004 Years of the World from the Number 4714 of the *Julian Period*, both which Numbers, *viz.* of the World 4004, and of the *Julian Period* 4714, agree with the firſt Year of the *Chriſtian Æra*, there will be left the Sum 710; which Sum, if divided by 28, without any Regard to the Quotient, 10 will be left for the Solar Cycle; if by 19, 7 will be left for the Lunar Cycle, or the Golden Number; if by 15, there will remain 5, for the Indiction. Likewiſe, if the Sum 6413, which anſwers to the Year of *Chriſt* 1700, be divided by 28, without minding the Quotient, 1 will remain for the Solar Cycle; if by 19, there remains 10 for the Lunar Cycle, or Golden Number; if by 15, 8 will be left for the Indiction. Therefore having thus found the Year of the *Julian Period* which anſwers to every Year before or after the Beginning of the *Chriſtian Æra*, we'll find with it the Solar Cycle, the Golden Number, and the Indiction, agreeable to that Year.

Neither is it ſurprizing that the *Julian Period* is ſaid to precede the Creation of the World by 709 Years, ſince it reſults from the Multiplication of their Cycles, which have not been all invented together; neither can they run together by a common Beginning, but within the Space of 7980 Years. This *Period* agrees with the *Conſtantinopolitan Epocha*, or *Period* us'd by the *Greeks*, except in this, that the Cycles of the Sun, Moon, and Indiction, are reckon'd differently; and in that the firſt Year of the *Conſtantinopolitan Period* differs from that of the *Julian Period*.

Hipparchus's *Period* is a Series of 304 Solar Years, returning in a conſtant Round, and reſtoring the New and Full Moons to the ſame Day of the Solar Year.

This *Period* ariſes by multiplying the *Calippick Period* by 4. *Hipparchus* aſſum'd the Quantity of the Solar Year to be 365 Days, 5 Hours, 55 Minutes, and 12 Seconds; and hence concluded, that in 104 Years *Calippus*'s *Period* would err a whole Day. He therefore multiplied the *Period* by 4, and from the Product caſt away an entire Day; tho' he could not thereby reſtore the New and Full Moons to the ſame Days throughout the whole *Period*, but they are ſometimes anticipated 1 Day, 8 Hours, 23 Minutes, 29 Seconds, and 20 Thirds.

Since we have mention'd the *Calippick Period*, we muſt ſay that it is a Series of 76 Years, returning in a perpetual Circle, which elaps'd, the New and Full Moons are ſuppos'd to return to the ſame Day of the Solar Year. The *Calippick Period* is an Improvement of the *Metonick* of 19 Years; which proving inaccurate, *Calippus* the *Athenian* multiplied it by 4, and thus aroſe the *Calippick Period*.

Note, That PERIOD, in this Place, *i. e.* in Chronology, denotes an *Epocha*, or Interval of Time, by which the Years are accounted; or a Series of Years, whereby, in different Nations, and on different Occaſions, Time is meaſur'd. *Cycle*, in Chronology, is a certain Period, or Series of Numbers, proceeding orderly from firſt to laſt, and recurring again from laſt to firſt, ſucceſſively, and without Interruption. *Indiction* (from *indictio*, which ſignifies Eſtabliſhment, Order, or Denunciation) is us'd in Chronology for a Kind of *Epocha*, or Manner of accounting Time among the *Romans*. *Petavius* ſays, that there is nothing in Chronology leſs known than the *Roman Indiction*; he means, then, its Origin and Commencement. It is the general Opinion, that it was inſtituted in the Time of *Conſtantine*, but it is a mere Gueſs; there were *Indictions* in the Time of the Emperor *Conſtantius*, as appears from the *Theodoſian* Code. The Learned hold, that *Indictions* were originally no other than certain annual Taxes, the Tariffs whereof were publiſh'd every Year: But why they were ſo call'd, why confin'd to a Cycle of 15 Years, when, and on what Occaſion inſtituted, is not known. We find three Kinds of *Indictions* mention'd in Authors; the *Indiction* of *Conſtantinople*, beginning on the firſt of *September*; the *Imperial*, or *Cæſarial Indiction*, on the 14*th* of *September*; and the *Roman Indiction*, which is that us'd in the Pope's Bulls, begins on the firſt of *January*.

The next Things to be conſider'd, in our *Calendar*, are the EPOCHA's, from the *Greek* επoχη, *Inhibition*; or επεχειν, to *ſuſtain*, *ſtop*, by reaſon *Epocha's* are a Term, or fix'd Point of Time, whence the Years are number'd, or accounted. They are alſo call'd *Æræ*, as we'll explain it afterwards.

There are two Sorts of *Epocha's*, the one ſacred, taken from the ſacred Books; and the other profane, taken from profane Authors. We'll begin with the *ſacred Epocha's*.

The firſt, among the *ſacred Epocha's*, from which the firſt Age of the World begins, takes its Beginning from the Creation; which, according to *Lancelot*'s Calculation, is to be fix'd at the Beginning of the Night preceding *Sunday October* 23, of the *Julian* Period 710; and ends at the Year of the World 1656, and almoſt two Months of the Year 1657.

The ſame *Epocha*, according to the Computation of the *Jews*, call'd alſo the *Jewiſh Epocha*, is the Year of the *Julian* Period 953, anſwering to the Year before *Chriſt* 3761; and commencing on the 7*th* Day of *October*. Hence ſubſtracting 952 Years from any given Year of the *Julian* Period, the Remainder is the Year of the *Jewiſh Epocha* correſponding thereto. This *Epocha* is ſtill in Uſe among the *Jews*.

The *Epocha* of the Creation, us'd by the *Greek* Hiſtorians, is the Year before the *Julian* Period 787; anſwering to the Year before *Chriſt* 5500. Hence, to any given Year of the *Julian* Period adding 787, the Sum gives the Year of this *Epocha*. The Author of this *Epocha* is *Julius Africanus*, who collected it from the Hiſtorians. But when it came to be admitted into civil Uſe, 8 Years were added to it; that ſo every Year thereof divided by 15, might exhibit the Indiction which the eaſtern Emperors us'd in their Charters and *Diploma's*.

The *Epocha* of the Creation us'd by the later *Greeks* and *Ruſſians*, is the Year 795 before the *Julian* Period; or the Year 5509 before *Chriſt*, commencing from the firſt Day of *September*; tho' the *Ruſſians*, having lately admitted the *Julian Calendar*, begin their Year from the firſt of *January*. Hence, adding 795 to the Year of the *Julian* Period, the Sum gives the Year of this *Epocha*. This *Æra* was us'd by the Emperors of the Eaſt in their *Diplomata*, &c. and thence alſo call'd the civil *Æra* of the *Greeks*. In Reality, it is the ſame with the *Epocha* of the *Conſtantinopolitan* Period; whence ſome call it the *Epocha* of the Period of *Conſtantinople*.

The *Alexandrian Epocha* of the Creation, is the Year 780 before the *Julian* Period; anſwering to the Year before *Chriſt* 5497; and commencing on the 29*th* of *Auguſt*. Hence, adding 5493 to the preſent Year of *Chriſt* 1741, the Sum, 7234, gives the preſent Year of this *Epocha*, or Years elaps'd ſince the Creation, according to this Computation. This *Epocha* was firſt concerted by *Panodorus*, a Monk of *Egypt*, to facilitate the Computation of *Eaſter*; whence ſome call it the *Greek Eccleſiaſtical Epocha*.

The *Euſebian Epocha* of the Creation, is the Year of the *Julian* Period 486, anſwering to the Year before *Chriſt* 4228, and commencing in Autumn. Hence, adding 4228 to the preſent Year of *Chriſt* 1741,

1741, the Reſult, 5969, is the preſent Year of this *Epocha*; which is us'd in *Euſebius*'s *Chronicon*, and the *Roman Martyrology*.

The ſecond *ſacred Epocha* is reckon'd from the End of the *Deluge*, or the Beginning of the Year of the World 1657, (in the 27*th* of the ſecond Month thereof; which anſwers to the 18*th* of our *December*, *Noah* came out of the Ark) and ends at the Vocation and Peregrination of *Abraham*, which happen'd in the Year of the World 2083; the 15*th* of the Month *Abib*, which anſwers to the 4*th* of our *May*; and therefore contains 426 Years, 4 Months, and 17 Days.

The *third ſacred Epocha* is from the Vocation and Departure of *Abraham* from *Haran* in *Meſopotamia*, for the Land of *Canaan*; and is continu'd to the Departure of the *Iſraelites* from *Egypt*, i. e. to the Year of the *World* 2513, and therefore contains 430 Years accompliſhed.

The 4*th ſacred Epocha*, begins at the Departure of the *Iſraelites* from *Egypt* (which happened the 15*th* Day of the Month *Abib*, *Exod.* ix.) and ends at the Time when the *Jews* firſt began to build the Temple of *Jeruſalem*, i. e. at the 4*th* Year of *Solomon*'s Reign; which correſponds to the Year of the *World* 2992; and thus comprehends 479 Years, and 15 Days.

The 5*th ſacred Epocha*, begins from the Foundation of the *Temple*, and ends with the *Babyloniſh Captivity*; and contains 456 Years; *Cyrus* having given Leave to the *Jews* to return to *Jeruſalem*, in the Year of the *World* 3468, of the *Julian Perod* 4178.

The 6*th* begins from the Time of *Cyrus* granting that Liberty to the *Jews*, and ends at *Chriſt*'s Nativity, or at the Year of the *World* 4000, of the *Julian Period* 4739, which is, in *Lancelot*'s Opinion, 532 Years.

The 7*th ſacred Epocha* begins at our Saviour's Birth, and is to continue to the later End of the World. And this *Epocha*, is either true, *i. e.* has its Beginning from the very Moment of that divine Birth, of which Chronologers do not agree among themſelves; or is *vulgar*, or commonly received in the Chriſtian Church. According to *Dionyſius Exiguus*, and ſome other Chronologers of his Time (who do not very well agree together) this *Epocha* begins from the firſt Day of *January*, the *Julian Year* 46; which Year agrees with the Year 4714, of the *Julian Period*; ſo that in their Syſtem, *Chriſt*'s Nativity is fixed to the 25*th* of *December*, of the *Julian Year* 45, and of the *Julian Period* 4713.

But the moſt exact Chronologers ſhew with *Lancelot* (from whom we have extracted theſe) that *Chriſt* was born four Years before this *Dionyſian Epocha*, i. e. the 25*th* of *December*, of the *Julian Year* 41, of the *Julian Period* 4709, of the *World* 4000; the fourth Year of the 193 *Olympiad*; of the Foundation of *Rome* 749; the 40*th* Year of the Empire of *Auguſtus*, reckoning from the Death of *Julius Cæſar*; and from the Battle of *Actium*, after which he had no Competitor, 27; the 36*th* of the Reign of *Herod the Great*.

However, it is certain, that *Chriſt*'s Nativity happened before *Herod*'s Death, as we learn from *Matt.* ii. For *Herod* died, after he had reigned 37 Years, ſince he had been ſaluted King by the *Romans*; or 34 after he had murthered *Antigonus* (according to *Joſephus*, *Lib.* 17. of the *Antiquities* of the *Jews*, *c.* 10. and *Lib. Bell. Judaic.* c. *ultim.*) for he received the Kingdom from the *Romans*, towards the *Autumn* of the ſixth *Julian Year*; he killed *Antigonus* the ninth *Julian Year*. Moreover, the 6th *Julian Year* is the ſame with the Year of the *World* 3964, of the *Julian Period* 4674, of the Empire of *Auguſtus*, from the Death of *Julius Cæſar*, the fifth, and of his firſt Conſul-ſhip, the fourth.

All Chronologers agree, that *Herod* was ſaluted King by the *Romans*, in the 6*th Julian Year*; ſo that after he had reigned 37 Years from that Time, or 34 from the Murder of *Antigonus*; he died in the 42d *Julian Year*, towards the 25th of *November*. Therefore it can eaſily be proved, as well from the Collation of the Times, in which his Succeſſors have reigned; as from the Eclipſe of the *Moon*, which *Joſephus* *Lib.* 17. of the *Antiquities* of the *Jews*, c. 8. mentioned to have happened during that Prince's laſt Sickneſs; for it appears in the Aſtronomical Tables, that the *Moon* ſuffered an Eclipſe the 13*th* of *March*, of the *Julian Year* 42, towards three in the Afternoon: From which Time *Herod* continued in a languiſhing Condition to the 25*th* of *November*, when he died.

Therefore *Chriſt* being born towards the Middle of the Night, wherein the 25th of *December* begins, as we learn it from the Churches Tradition; his Nativity cannot be put farther back than the Beginning of the *Julian Year* 41, which is the 40*th* of the Empire of *Auguſtus*, from *Julius Cæſar*'s Death; the 4709, of the *Julian Period*, and 4000 from the Creation of the World: And thus, *Chriſt*'s Nativity precedes the common Chriſtian *Æra*, by four whole Years; which common *Æra* begins, the 46*th Julian Year*, the 45*th* of the Empire of *Auguſtus*, from *Julius Cæſar*'s Death, of the *Julian Period* 4714, of the *World* 4004. The firſt Year of the 195 *Olympiad*, of the Foundation of *Rome* 754, from the Battle of *Actium* 32.

But as we are to mark the Beginning of *Tiberius*'s Empire at the Death of *Auguſtus*, which happened in the *ſextile Month*, of the *Julian Year* 59, of the *Julian Period* 4727, of the *World* 4017, of Chriſt 18, of the common Chriſtian *Æra* 14; conſequently the 15*th* Year of his Empire, muſt have begun, in the Month of *Auguſt* in the *Julian Year* 73, of Chriſt 32, of the Chriſtian *Æra* 28, of the *Julian Period* 4741, of the *World* 4031; in which Year, *John*, *Chriſt*'s Precurſor, began to preach the Baptiſm of Repentance, and that in all Appearance, in the 7*th* Month which was a penitential Month among the *Jews*, and which anſwers in a great Part, to our *October*.

Chriſt having been baptized the 6*th* of *January*, according to the Tradition of the oriental, as well as of the occidental Church; and *John*, before *Chriſt* came to be baptized, having *fulfilled his Courſe*, Acts xiii. 25. which could not be ſhorter than a whole Year, eſpecially if we conſider that he had gained already ſo great an Authority, that the Publicans and Soldiers reſorted to him, and were baptized by him; therefore it does not ſeem probable, that the Baptiſm of *Chriſt*, ought to be referred to the next Year following, the Vocation of *John*, i. e. to the *Julian Year* 74, and of the Vulgar *Æra* 29, but to the 6*th* of *January* of the other, *viz.* the *Julian Year* 75, of the Vulgar *Æra* 30, of the *World* 4033; in which *Chriſt* accompliſhed the 33d Year of his Age, and began the 34*th*.

Chriſt, after his Baptiſm ſolemnized four *Eaſters*. In the firſt he drove all the Venders and Buyers out of the Temple, *John* ii. 15. In the ſecond he cured a Man who had been ſick 38 Years, *John* v. In the third he fed five thouſand Men with five Loaves. *John* vi. In the laſt (which according to the Aſtronomical Tables happened the third of *April*, the ſixth *Feria* of the *Julian Year* 78, of the Chriſtian *Æra* 33) he was crucified by the *Jews*; the divine Redeemer of the human Race, being then not 34, according to the vulgar Opinion, but in reality 37 Years of Age. So that if we'll ſpeak accurately, *Chriſt* lived upon Earth, and among us Men, 36 Years, three Months, nine Days, and 15 Hours, *i. e.* from the Middle of the Night; which began the 25th Day of *December*, of the *Julian Year* 41, to the 9*th* Hour, according to the *Jews* Manner of reckoning, or three in the Afternoon according to ours, of the third of *April* of the *Julian Year* 78.

But to return to the Vulgar, or moſt commonly received *Æra* of the Chriſtians, as that firſt Year followed the *Biſſextile Julian Year*; it happened from thence, that from the Time of the Inſtitution of that *Epocha*, to this our preſent Time, every fourth Year, has been *Biſſextile*, in the *Julian Calendar*; as

as ſettled by *Dionyſius Exiguus*, by Nation a *Scythian*; who flouriſhed under *Juſtinian*, about the Year 507: Though *Dionyſius* borrowed the Hint from *Panodorus* an *Egyptian* Monk. 'Till his Time the Generality of Chriſtians computed their Years, either from the Building of *Rome*, or according to the Order of the Emperors and Conſuls, or even from the Perſecution of *Diocleſian*; which ſome Authors mark, at the Year of the common *Æra* 302, and others at the Year 303.

This Diverſity occaſioning a great Diſtraction between the Churches of the *Eaſt* and *Weſt*; *Dionyſius* to compoſe the ſame, firſt propoſed a new Form of the Year, with a new general *Æra*; which, in a few Years time, was generally admitted. *Dionyſius* began his Account, from the Conception, or Incarnation, properly called *Lady-Day*, or the *Annunciation*: Which Method ſtill obtains in the Dominions of *Great-Britain*, and there only; ſo that the *Dionyſian*, and *Engliſh Epocha*, is the ſame. In the other Countries of *Europe*, they reckon from the firſt of *January*; except in the Court of *Rome*, where the *Epocha* of the Incarnation ſtill obtains for the Date of their *Bulls*.

It muſt be added that this *Epocha* of *Dionyſius*, is charged with a Miſtake; the common Opinion is, as we have obſerved, that it places our Saviour's Nativity a Year too late; or that he was born the Winter preceding the Time preſcribed by *Dionyſius* for his Conception. But *Petavius* pretends, that the Fault lies on *Beda*, who miſinterpreted *Dionyſius*, and whoſe Interpretation is followed in *England*. For *Dionyſius* began his Cycle from the Year of the *Julian Period* 4712; but his *Epocha*, from the Year 4713, wherein the Vulgar *Æra*, ſuppoſes *Chriſt* to have been incarnate. The Year therefore, which according to the Vulgar *Epocha*, is the firſt Year of *Chriſt*; according to *Dionyſius*'s *Æra*, is the ſecond. So that the preſent Year, which we call 1741, ſhould, in Juſtice, be 1742. Though ſome Chronologers, inſtead of one Year, will have the Error two. To this Vulgar *Æra*, as a ſure fixed Point, Chronologers uſed to reduce all the other *Epocha's*; though there is not one of them, but what is controverted; ſo much Uncertainty there is in the Doctrine of Time.

Beſides as there are two different Opinions, concerning the Number of Years elapſed from the Creation of the World, to the Birth of our Saviour; one, ſupported by the Authority of the *Hebrew* Text, which reckons 4000 Years between the Creation of the World, and *Chriſt*'s Nativity; and the other deducted from the Computation of the *Septuagint*, and the Hiſtorian *Joſephus*; and which makes the Duration of the World to *Chriſt's* Nativity, 5971 Years; which Difference could never be compoſed yet; we'll follow the firſt Opinion, as the moſt probable; ſuſpending, however, our Judgment, concerning the laſt, which has been followed by ſeveral of the antient Fathers of the Church. But that Difference of Computation extends no farther than the *Old Teſtament*, and has no Report to the Chriſtian *Æra*.

There are likewiſe ſeveral *Prophane Epocha's*. The firſt, which was in uſe among the *Greeks*, is that of the *Olympiads*; and had its Origin from the *Olympick* Games, celebrated at the Beginning of every fifth Year, near the City *Olympia* in *Peloponneſus*. The *Olympiads* were alſo called *Anni Iphiti*, from *Iphitus*, who inſtituted, or at leaſt renewed the Solemnity of the *Olympick* Games.

The firſt *Olympiad* commenced, according to ſome, in the Year 3938, of the *Julian Period*; the Year from the Creation 3174; the Year before *Chriſt* 774; and 24 Years before the Foundation of *Rome*: Or rather, as others will have it, in the Year of the *World* 3251; the Year of the *Julian Period* 3941; and 23 Years before the Building of *Rome*. The *Peloponneſian* War began on the firſt Year of the 87*th Olympiad*. *Alexander* the Great died the firſt Year of the 114*th*; and *Jeſus Chriſt* was born the firſt Year of the 195*th Olympiad*.

The ſecond *Prophane Epocha*, which was properly that of the *Romans* begun at the Building of *Rome*, U. C. which was built according to *Varro*'s Computation, towards the End of the third Year of the ſixth *Olympiad*, which is the Year of the *Julian Period* 3961, of the *World* 3251, before the Chriſtian *Æra* 753: Or 3962, according to the *Faſti Capitolini*, which is a Year later, than the *Varroniam* Computation. As the *Greeks* uſed to reckon by *Olympiads*, or four Years, the *Romans* likewiſe reckoned by *Luſtra*, or five Years, in Reſpect to the cenſorial Dignity, which was quinquennial; becauſe the Cenſors, every fifth Year, which was the laſt of their Magiſtracy, exacted the Cenſus, or Tribute, impoſed by them on the People. 'Tis ſaid, that the *Luſtra* were changed in *Conſtantine*'s Time, into Indictions, which compreheded the Space of three *Luſtra*, or 15 Years.

If the Years of this *Epocha* be fewer than 754, ſubſtracting them from 754, or 753; you have the Year before *Chriſt*, and on the contrary, if they be more than 745, adding them to the ſame, the Sum is the Number of Years ſince *Chriſt*. Laſtly, adding the Year before *Chriſt*, to 753, or 752; the Sum will give the Year of this *Epocha*, or the Time ſince the Building of *Rome*, thus, *e. g.* the preſent Year 1741, according to *Varro*, is the Year of *Rome* 2054.

The third *Prophane Epocha*, is that of *Nabonaſſar*, King of *Babylon*, and its Beginning is marked at the 26*th* of *February*, of the Year of the *Julian Period* 3967, of the *World* 3257, before the Chriſtian *Æra* 747, when *Nabonaſſar*, or *Beleſis*, Governor of *Babylon*, who ſeems to be the ſame as *Baladan*, *Lib.* 4. *Kings* xx. 12. and *Iſaiah* xxxix. 1. who having entered into an Alliance with *Arbaces*, General of the *Medes*, gained the Kingdom of *Babylon*; and *Arbaces* having beſieged *Nineveh*, reſtored the *Medes* to their antient Liberty; and thereby obliged *Sardanapalus* to burn himſelf, with his Capital and his Riches. Whence the Empire of the *Aſſyrians*, who from *Ninus* had ſubſiſted for the Space of 520 Years, and included all the ſuperior *Aſia*, was then divided between the *Aſſyrians* themſelves, the *Medes*, and the *Babylonians*.

This *Epocha* of *Nabonaſſar*, is uſed by *Ptolemy* in his Aſtronomical Obſervations, by *Cenſorinus* and others, and is compoſed of *Egyptian Years*.

The fourth *Prophane Epocha*, is that of the *Hegira*, or *Mahometan Epocha*, whoſe Beginning is taken from *Mahomet*'s Flight; which the *Mahometans* called *Hegira*, or Perſecution, becauſe *Mahomet* had been in ſome Dangers occaſioned by the Novelty of his Doctrine. This Flight happened in the Year 5335, of the *Julian Period*, anſwering to the Year of *Chriſt* 622. This *Epocha* commences on the 16*th* of *July*, on a *Friday*, which ſince has been a Holy-day among the *Muſſulmen*.

The fifth is the *Spaniſh Epocha*; for the *Spaniards* having begun to reckon their Years, from the Beginning of *Auguſtus*'s Reign, *ab Exordio Regni Auguſti*, and marked it in their *Calendars*, by the Initial Letters of thoſe Words *A. E. R. A.* it occaſioned the giving to it the Name of *Æra*; for *Auguſtus* began to reign over *Spain*, after the Partition of the Empire between him and *Antony*, i. e. the eighth *Julian Year*; the 38*th* Year before the common *Æra*, and the Year of the *Julian Period* 4676.

The ſixth is the *Jerdegerdick*, or *Perſian Epocha*, which is the Year of the *Julian Period* 5345; anſwering to the Year of *Chriſt* 632, and commencing on the 16*th* of *June*.

Hitherto we have been no further than the *Julian Calendar*, which the Fathers of the Council of *Nice*, *Dionyſius Exiguus*, and others have followed, in regulating the Solemnization of the Feaſt of *Eaſter*; but it has been found ſince, to contain two very great Errors.

The firſt Error is that of *Julius Cæſar*, that the Year is defined, or accompliſhed, in the Courſe of 365 Days, and ſix whole Hours; whereas thoſe ſix Hours are not entire, but want very near eleven Minutes. Therefore the very next Year after the Inſtitution of the

Julian Calendar, the Spring anticipated its Place, in the Revolution of the Seaſons, by thoſe 11 Minutes; which, in the Space of four Years, increas'd to almoſt three Quarters of an Hour; and in that of 131 Years made up a whole Day; and therefore, within 400 Years, the vernal Equinox happen'd three Days ſooner than it ſhould; by which continual Anticipation, it came to paſs, that towards the Year 1582, the vernal Equinox had anticipated by almoſt ten Days the Place it had in the Time of *Julius Cæſar*, and was reduc'd from the 21*ſt* Day of *March* to the 11*th*.

The ſecond Error of the *Julian Calendar*, conſiſts in this, that its Author had fix'd the Cycle of nineteen Years, or Golden Number, to be ſubject to no Changes; and that every 19*th* Year the New and Full Moons ſhould always return on the ſame Days, the ſame Hours, and the ſame Minutes; whereas they anticipate an Hour, and very near 30 Minutes: So that after 312 Days and a Half, according to *Clavius*, or 310, according to others, they ſhould happen one Day ſooner.

Therefore as the Council of *Nice* decreed that *Eaſter* ſhould be, for ever, held on the *Sunday* which falls upon, or next after the Full Moon next after the twenty-firſt of *March*; *i. e.* the *Sunday* which falls upon, or next after the firſt Full Moon after the vernal Equinox; and that within almoſt 300 Years from the Council of *Nice* the New and Full Moons happen'd four Days, and more, ſooner than indicated by the Cycle of 19 Years, or the Golden Number; and what was taken for the 14*th* Moon, was in Reality the 18*th*; *Eaſter* was then no longer celebrated from the 15*th* Moon to the 21*ſt*; but from the 19*th* to the 25*th*, incluſively.

To reform, or correct thoſe Errors, Pope *Gregory* XIII, with the Advice of *Aloyſius Lilius*, *Clavius*, *Ciaconius*, and other famous Aſtronomers, by throwing ten Days out of the Month of *October*, to reſtore the Equinox to its Place, *viz.* the twenty-firſt of *March*; and leſt the vernal Equinox ſhould return from the twenty-firſt of *March* to the Middle of the ſame Month, a Subtraction was made of three biſſextile Days in the Space of four Centuries: Therefore as the Year 1600 had been Biſſextile, and the Years 1700, 1800, and 1900, ſhould be Biſſextile, according to the *Julian Calendar*; they were made common Years, and without the Addition of the intercalary or biſſextile Day. Whence the following Diſtich;

Biſſextilis adeſt annus quicumque quaternus,
Centenus tollet, quadringenteſimus addet.

The Error which perplex'd moſt the Aſtronomers employ'd by the Pope to the Reformation of the *Calendar*, was that found in the Lunar Cycle, or Golden Number; this they conſider'd as an almoſt inſuperable Difficulty, till the Pope was preſented with a Book written by *Aloyſius*, a *Roman* Phyſician, and Aſtronomer; which contain'd a Cycle of Epacts, to ſupply the Place, in the *Calendar*, of the Golden Number. The *Gregorian Calendar*, therefore, differs from the *Julian*, both in the Form of the Year, and in that Epacts are ſubſtituted in lieu of Golden Numbers; which we'll ſpeak of after we have obſerv'd, *en paſſant*, that tho' the *Gregorian Calendar* be preferable to the *Julian*, yet is it not without its Defects, (perhaps, as *Tycho Brahe* and *Caſſini* imagine, it is impoſſible ever to bring the Thing to a perfect Juſtneſs) for, firſt, the *Gregorian* Intercalation does not hinder but that the Equinox ſometimes lags behind the 21*ſt* of *March*, as far as the 23*d*; and ſometimes anticipates it, falling on the 19*th*; and the Full Moon which falls on the 20*th* of *March* is ſometimes the Paſchal, but not ſo accounted by the *Gregorians*. On the other Hand, the *Gregorians* account the Full Moon of the 22*d* of *March* the Paſchal, which yet falling before the Equinox, is not Paſchal.

In the firſt Caſe, therefore, *Eaſter* is celebrated in an irregular Month; in the latter, there are two *Eaſters* in the ſame eccleſiaſtical Year.

In like manner, the cyclical Computation being founded on mean Full Moons, which yet may precede or follow the true ones by ſome Hours; the Paſchal Full Moon may fall on *Saturday*, which is yet referr'd by the Cycle to *Sunday*; whence, in the firſt Caſe, *Eaſter* is celebrated 8 Days later than it ſhould be; in the other it is celebrated on the very Day of the Full Moon with the *Jews* and *quartodeciman Hereticks*; contrary to the Decree of the Council of *Nice*.

Scaliger and *Claviſius* ſhew other Faults in the *Gregorian Calendar*, ariſing from the Negligence and Inadvertency of the Authors; notwithſtanding which, 'tis follow'd by all Nations of the *Roman* Church, and by moſt of the *Proteſtants*; tho' the *Julian Calendar* is ſtill retain'd in *England*, without the *Gregorian* Correction, or even that introduc'd among ſome of the *Proteſtant* States of *Germany*, in the Year 1700, when 11 Days were at once thrown out of the Month of *February*; ſo that in 1700, *February* had but 18 Days: By this Means, the corrected Stile agrees with the *Gregorian*. This Alteration, in the Form of the Year, they admitted for a Time, in Expectation that the real Quantity of the Tropical Year being at length more accurately determin'd by Obſervation, the *Roman Catholicks* would agree with them on ſome more convenient Intercalation. This corrected *Calendar*, ſetting aſide all Apparatus of Golden Numbers, Epacts, and Dominical Letters, determines the Equinox, with the Paſchal Full Moon, and the moveable Feaſts depending thereon, by aſtronomical Computation, according to the *Rudolphine* Tables. At preſent, for the *Epacts*.

Epacts, in Chronology, are the Exceſſes of the Solar Month above the Lunar Synodical Month; and of the Solar Year above the Lunar Year of 12 Synodical Months; or of ſeveral Solar Months above as many Synodical Months; and ſeveral Solar Years above as many Dozens of Synodical Months. The *Epacts*, then, are either *annual*, or *menſtruual*.

Menſtrual Epacts, are the Exceſſes of the Civil, or *Calendar* Month, above the Lunar Month. Suppoſe, *E. gr.* it were New Moon on the firſt Day of *January*; ſince the Lunar Month is 29 Days, 12 Hours, 44 Minutes, and 3 Seconds, and the Month of *January* contains 31 Days; the *menſtrual Epact* is 1 Day, 11 Hours, 15 Minutes, and 57 Seconds.

Annual Epacts are the Exceſs of the Solar Year above the Lunar. Hence, as the common Solar Year is 365 Days, and the Lunar only 354; there is, therefore, between them, a Difference of 11 Days. And as the Courſe of the Solar and Lunar Years is continual, the latter Differences muſt be continually added to the former, throwing 30 out of the whole as often as poſſible.

Therefore the firſt *Epact* is 11, the ſecond 22, the third 3; and by adding the three Differences, they make up 33, from which, if 30 are ſubſtracted, there will remain 3; the fourth *Epact* will be 14, *i. e.* by adding 11 and 3; the fifth *Epact* will be 25, adding the other 11; the ſixth *Epact* will be 6, and by adding 11 and 25, the Sum will be 36; from which Sum, 30 being ſubtracted, there will remain 6, *&c.*

The 30 are rejected, that hence might be form'd *emboliſmick* Moons, which are all full, or of 30 Days, the laſt excepted; as we have obſerv'd, ſpeaking of the Golden Number. Therefore if all the *Epacts* be augmented, by the perpetual Addition of 11 Days, till the laſt Number 19 happens; they will make up 19 Times 11 Days, or 209; which might be divided into 7 *emboliſmick* Months, the firſt ſix whereof will be of 30 Days each, 29 Days, only, remaining for the 7*th* Month: Therefore 39 Days, only, ſhould be thrown out that Year, tho' 30 are thrown out to render the *Ratio* of the *Calculus* every Way uniform. Tho', at the ſame Time, no Error enſues from it, and if it did, it could ſoon be rectify'd; for if 30 Days be aſſign'd to that Moon which ſhould have but 29, 12 Days are given to the following *Epact*, which ought to have but 11. Whence, Compenſation is made, and the *Epact* of 12 Days cut ſhort of one Day of the preceding

preceding Lunation; as if the Moon had omitted that Day, or leap'd over it; whence that *Eliſion* is commonly call'd a *Leap of the Moon.*

Becauſe *Epacts* are to be thus compos'd, by the continual Addition of 11 Days, and the Rejection of 30, that they may expire with the Lunar Cycle of 19 Years, and begin again with the ſame; there are to be as many *Epacts* as there are Golden Numbers; as in the following Table.

Golden Number	Epacts	Golden Number	Epacts	Golden Number	Epacts
1	XI	7	XVII	13	XXIII
2	XXII	8	XXVIII	14	IV
3	III	9	IX	15	XV
4	XIV	10	XX	16	XXVI
5	XXV	11	I	17	VII
6	VI	12	XII	18	XVIII
				19	XXIX

This Order of the Golden Numbers, and of the *Epacts*, had been perpetual, and never ſubject to any Variation, if the Intercalation was never to be left out, which muſt be done thrice in 400 Years; and if the New and Full Moons were never after the Courſe of 19 Years to anticipate their Place. But as often as an Intercalation is omitted in a Year, which, according to the *Julian Calendar*, ſhould be Biſſextile, (for we follow in this Place the *Gregorian* Reformation) *viz.* 1800, or 1900, then the Day which, in the old *Calendar* ſhould have been call'd the 29*th* of *February*, is the 1*ſt* Day of *March* after the Reformation; becauſe the Intercalation being omitted, *February* has only 28, and not 29 Days. Therefore if the New Moon ſhould have fell on the firſt Day of *March*, in the old *Calendar*, it pertains to the ſecond in the new, and happens a Day later. This Stay of the Moon is call'd *Metemptoſis.*

Moreover, as the New Moons, after 19 Years, anticipate their Place by one Hour, and very near thirty Minutes; hence it happens, that after twelve Years and a Half they return ſooner by a whole Day to their Place; and this Anticipation is call'd *Proemptoſis.* Therefore, in order that the Golden Number, and the 19 *Epacts* anſwering to it, may, after the *Peremptoſis*, indicate the New Moon; each Number ſhould be carried back to the preceding Place, towards the Beginning of the Year; and even ſhould change Place, as often as the *Proemptoſis* or *Metemptoſis* ſhould happen, *i. e.* when the Solar or Lunar Equation is to be added.

But as that Equation could ſucceſſively fall in every Day of each Month, there would be wanted as many *Calendars* as there are Days in the Month exhibited in thoſe *Calendars*, the *Golden Numbers*, as well as the *Epacts* anſwering to them. For all the *Epacts* are not always in Uſe, but only nineteen, which are us'd till they are render'd uſeleſs by a too great Increaſe of the Difference between the Lunar Cycle and the Civil Year; for then they are ſucceeded by nineteen other *Epacts.*

However, *Lilius*, by finding the Secret to propagate the Golden Number into 30 *Epacts*, has eas'd us of that monſtrous Heap of *Calendars*; for theſe Numbers being affix'd to every Day of the Month, without Exception, it is very eaſy, when the Equation of the Moon, or of the Sun, happens to change the Cycle. For if the New Moon anticipates the Place by one Day, becauſe of the *Proemptoſis*, the Cycle aſcends to the next ſuperior *Epact*, which exceeds by one that which, without the *Proemptoſis*, muſt have been us'd. But if, on the contrary, the New Moons happen later by a Day, the *Epact* deſcends, becauſe of the *Metemptoſis*, to the next inferior Place, which is leſſer by one than that which had been us'd if there had been no *Metemptoſis.* If it ever happen'd that the Difference ſhould be of two, or more Days, the Cycle will aſcend or deſcend as many Degrees, at the Beginning or End of the Months; but in order that theſe Rules may be ſtill more obvious to my Reader, I have plac'd here the four firſt Columns of the Tables of the Months. In the firſt Column are the *Epacts*, in *Roman* Figures; in the ſecond the *Dominical Letters*; in the third the *Calends* and *Nones*; and in the fourth the Days of the Months, mark'd with *Arabick* Characters.

JANUARY.			
Cycle of Epacts.	D. L.	Calends	Days
*	A		1
XXIX	b	IV	2
XXVIII	c	III	3
XXVII	d	prid.	4
XXVI	e	non.	5
25. XXV	f	VIII	6
XXIV	g	VII	7
XXIII	A	VI	8
XXII	b	V	9
XXI	c	IV	10
XX	d	III	11
XIX	e	prid.	12
XVIII	f	Ides.	13
XVII	g	XIX	14
XVI	A	XVIII	15
XV	b	XVII	16
XIV	c	XVI	17
XIII	d	XV	18
XII	e	XIV	19
XI	f	XIII	20
X	g	XII	21
IX	A	XI	22
VIII	b	X	23
VII	c	IX	24
VI	d	VIII	25
V	e	VII	26
IV	f	VI	27
III	g	V	28
II	A	IV	29
I	b	III	30
*	c	prid.	31

FEBRUARY.			
Cycle of Epacts.	D. L.	Calends	Days
XXIX	d		1
XXVIII	e	IV	2
XXVII	f	III	3
25. XXVI	g	prid.	4
XXV. XXIV	A	Non.	5
XXIII	b	VIII	6
XXII	c	VII	7
XXI	d	VI	8
XX	e	V	9
XIX	f	IV	10
XVIII		III	11
XVII	A	prid.	12
XVI	b	Ides.	13
XV	c	XVI	14
XIV	d	XV	15
XIII	e	XIV	16
XII	f	XIII	17
XI	g	XII	18
X	A	XI	19
IX	b	X	20
VIII	c	IX	21
VII	d	VIII	22
VI	e	VII	23
V	f	VI	24
IV	g	V	25
III	A	IV	26
II	b	III	27
I	c	prid.	28

MARCH.			
Cycle of Epacts.	D L.	Calends	Days
*	d		1
XXIX	e	VI	2
XXVIII	f	V	3
XXVII	g	IV	4
XXVI	A	III	5
25. XXV	b	prid.	6
XXIV	c	Non.	7
XXIII	d	VIII	8
XXII	e	VII	9
XXI	f	VI	10
XX	g	V	11
XIX	A	IV	12
XVIII	b	III	13
XVII	c	prid.	14
XVI	d	Ides.	15
XV	e	XVII	16
XIV	f	XVI	17
XIII	g	XV	18
XII	A	XIV	19
XI	b	XIII	20
X	c	XII	21
IX	d	XI	22
VIII	e	X	23
VII	f	IX	24
VI	g	VIII	25
V	A	VII	26
IV	b	VI	27
III	c	V	28
II	d	IV	29
I	e	III	30
*	f	prid.	31

APRIL.			
Cycle of Epacts.	D. L.	Calend.	Days
XXIX	g		1
XXVIII	A	IV	2
XXVII	b	III	3
XXVI	c	prid.	4
XXV-XXIV	d	Non.	5
XXIII	e	VIII	6
XXII	f	VII	7
XXI	g	VI	8
XX	A	V	9
XIX	b	IV	10
XVIII	c	III	11
XVII	d	prid.	12
XVI	e	Ides.	13
XV	f	XVIII	14
XIV	g	XVII	15
XIII	A	XVI	16
XII	b	XV	17
XI	c	XIV	18
X	d	XIII	19
IX	e	XII	20
VIII	f	XI	21
VII	g	X	22
VI	A	IX	23
V	b	VIII	24
IV	c	VII	25
III	d	VI	26
II	e	V	27
I	f	IV	28
*	g	III	29
XXIX	A	prid.	30

MAY.			
Cycle of Epacts.	D. L.	Calends	Days
XXVIII	b		1
XXVII	c	VI	2
XXVI	d	V	3
25. XXV	e	IV	4
XXIV	f	III	5
XXIII	g	prid.	6
XXII	A	Non.	7
XXI	b	VIII	8
XX	c	VII	9
XIX	d	VI	10
XVIII	e	V	11
XVII	f	IV	12
XVI	g	III	13
XV	A	prid.	14
XIV	b	Ides.	15
XIII	c	XVII	16
XII	d	XVI	17
XI	e	XV	18
X	f	XIV	19
IX	g	XIII	20
VIII	A	XII	21
VII	b	XI	22
VI	c	X	23
V	d	IX	24
IV	e	VIII	25
III	f	VII	26
II	g	VI	27
I	A	V	28
*	b	IV	29
XXIX	c	III	30
XXVIII	d	prid.	31

JUNE.			
Cycle of Epacts.	D. L.	Calends	Days
XXVII	e		1
25. XXVI	f	IV	2
XXV.XXIV	g	III	3
XXIII	A	prid.	4
XXII	b	Non.	5
XXI	c	VIII	6
XX	d	VII	7
XIX	e	VI	8
XVIII	f	V	9
XVII	g	IV	10
XVI	A	III	11
XV	b	prid.	12
XIV	c	Ides.	13
XIII	d	XVIII	14
XII	e	XVII	15
XI	f	XVI	16
X	g	XV	17
IX	A	XIV	18
VIII	b	XIII	19
VII	c	XII	20
VI	d	XI	21
V	e	X	22
IV	f	IX	23
III	g	VIII	24
II	A	VII	25
I	b	VI	26
*	c	V	27
XXIX	d	IV	28
XXVIII	e	III	29
XXVII	f	prid.	30

JULY.			
Cycle of Epacts.	D. L.	Calends	Days
XXVI	g		1
25. XXV	A	VI	2
XXIV	b	V	3
XXIII	c	IV	4
XXII	d	III	5
XXI	e	prid.	6
XX	f	Non.	7
XIX	g	VIII	8
XVIII	A	VII	9
XVII	b	VI	10
XVI	c	V	11
XV	d	IV	12
XIV	e	III	13
XIII	f	prid.	14
XII	g	Ides.	15
XI	A	XVII	16
X	b	XVI	17
IX	c	XV	18
VIII	d	XIV	19
VII	e	XIII	20
VI	f	XII	21
V	g	XI	22
IV	A	X	23
III	b	IX	24
II	c	VIII	25
I	d	VII	26
*	e	VI	27
XXIX	f	V	28
XXVIII	g	IV	29
XXVII	A	III	30
25. XXVI	b	prid.	31

AUGUST.			
Cycle of Epacts.	D. L.	Calends	Days
XXV.XXIV	c		1
XXIII	d	IV	2
XXII	e	III	3
XXI	f	prid.	4
XX	g	Non.	5
XIX	A	VIII	6
XVIII	b	VII	7
XVII	c	VI	8
XVI	d	V	9
XV	e	IV	10
XIV	f	III	11
XIII	g	prid.	12
XII	A	Ides.	13
XI	b	XIX	14
X	c	XVIII	15
IX	d	XVII	16
VIII	e	XVI	17
VII	f	XV	18
VI	g	XIV	19
V	A	XIII	20
IV	b	XII	21
III	c	XI	22
II	d	X	23
I	e	IX	24
*	f	VIII	25
XXIX	g	VII	26
XXVIII	A	VI	27
XXVII	b	V	28
XXVI	c	IV	29
25. XXV	d	III	30
XXIV	e	prid.	31

SEPTEMBER.			
Cycle of Epacts.	D. L.	Calends	Days
XXIII	f		1
XXII	g	IV	2
XXI	A	III	3
XX	b	prid.	4
XIX	c	Non.	5
XVIII	d	VIII	6
XVII	e	VII	7
XVI	f	VI	8
XV	g	V	9
XIV	A	IV	10
XIII	b	III	11
XII	c	prid.	12
XI	d	Ides.	13
X	e	XVIII	14
IX	f	XVII	15
VIII	g	XVI	16
VII	A	XV	17
VI	b	XIV	18
V	c	XIII	19
IV	d	XII	20
III	e	XI	21
II	f	X	22
I	g	IX	23
*	A	VIII	24
XXIX	b	VII	25
XXVIII	c	VI	26
XXVII	d	V	27
25. XXVI	e	IV	28
XXV.XXIV	f	III	29
XXIII	g	prid.	30

OCTOBER.			
Cycle of Epacts.	D. L.	Calends	Days
XXII	A		1
XXI	b	VI	2
XX	c	V	3
XIX	d	IV	4
XVIII	e	III	5
XVII	f	prid.	6
XVI	g	Non.	7
XV	A	VIII	8
XIV	b	VII	9
XIII	c	VI	10
XII	d	V	11
XI	e	IV	12
X	f	III	13
IX	g	prid.	14
VIII	A	Ides.	15
VII	b	XVII	16
VI	c	XVI	17
V	d	XV	18
IV	e	XIV	19
III	f	XIII	20
II	g	XII	21
I	A	XI	22
*	b	X	23
XXIX	c	IX	24
XXVIII	d	VIII	25
XXVII	e	VII	26
XXVI	f	VI	27
25. XXV	g	V	28
XXIV	A	IV	29
XXIII	b	III	30
XXII	c	prid.	31

NOVEMBER.			
Cycle of Epacts.	D. L	Calends	Days
XXI	d		1
XX	e	IV	2
XIX	f	III	3
XVIII	g	prid.	4
XVII	A	Non.	5
XVI	b	VIII	6
XV	c	VII	7
XIV	d	VI	8
XIII	e	V	9
XII	f	IV	10
XI	g	III	11
X	A	prid.	12
IX	b	Ides.	13
VIII	c	XVIII	14
VII	d	XVII	15
VI	e	XVI	16
V	f	XV	17
IV	g	XIV	18
III	A	XIII	19
II	b	XII	20
I	c	XI	21
*	d	X	22
XXIX	e	IX	23
XXVIII	f	VIII	24
XXVII	g	VII	25
25. XXVI	A	VI	26
XXV.XXIV	b	V	27
XXIII	c	IV	28
XXII	d	III	29
XXI	e	prid.	30

DECEMBER.			
Cycle of Epacts.	D. L.	Calends	Days
XX	f		1
XIX	g	IV	2
XVIII	A	III	3
XVII	b	prid.	4
XVI	c	Non.	5
XV	d	VIII	6
XIV	e	VII	7
XIII	f	VI	8
XII	g	V	9
XI	A	IV	10
X	b	III	11
IX	c	prid.	12
VIII	d	Ides.	13
VII	e	XIX	14
VI	f	XVIII	15
V	g	XVII	16
IV	A	XVI	17
III	b	XV	18
II	c	XIV	19
I	d	XIII	20
*	e	XII	21
XXIX	f	XI	22
XXVIII	g	X	23
XXVII	A	IX	24
XXVI	b	VIII	25
25. XXV	c	VII	26
XXIV	d	VI	27
XXIII	e	V	28
XXII	f	IV	29
XXI	g	III	30
19. XIX	A	prid.	31

In the first Column opposite to the first Day of *January*, is placed the *Asterisk* * ; opposite to the second Day, the Number XXIX ; and opposite to the third Day the Number XXVIII, *&c.* in Order that Number I, may fall on the 30*th* Day of *January*: Then again, a small Star is placed to the 31*st* of *January*; and Number XXIX to the first of *February*; and thus, by Retrogradation is made a Progress throughout every Day of the Year.

But because the *Lunar Months* are alternately full, and *Cavi*, or deficient; there have been invented six Interruptions, by taking two *Epacts* into one, and the same Place, *viz.* XXIV and XXV, and that in six Places of the *Calendar*, *viz.* in *February*, *April*, *June*, *August*, *September*, and *November*. For this Reason it happen'd that all the Paschal Lunations, the last excepted, are all *Cava*, or imperfect, as they were in the Time of the Council of *Nice*, whereby the 14 *full Moons* are demonstrated with more Accuracy; for if each of the twelve Lunations were of 30 Days, they altogether would make up 360 Days, but as by those six *Interruptions*, six Days are retrenched, they then produce only, 354 Days; so that the common *Solar Year* of 365 Days, exceeds always the *Lunar Year* by eleven Days, and therefore the twelfth Lunation is terminated at the 20*th* Day of *December*; wherefore eleven *Epacts* are to be fetched from the 21*st* of *December* to the 31*st*, *viz.* * XXIX, XXVIII. *&c.*

If I be asked, why I place the *Asterisk* *, opposite to the first Day of *January*, and not rather the *Epact* XXX? I'll answer, that my Reason for acting thus, is, That as it happens often, that two Lunations end in the Month of *December*; one, for Example, the first Day of that Month, in which Case there remain 30 Days; and the other the last Day of the same Month, in which Case it remains, 0, or nothing: But as the *Epact* denotes the Number of Days remaining

maining after the Lunation ended in the Month of *December*, certainly the *Epact* XXX, or 0, or both, ſhould be affixed to the firſt of *January*; but as that would be ambiguous and troubleſome, I judge it more proper to mark it, with an indifferent Sign, ſuch as the *Aſteriſk* *.

It might be aſk'd, ſecondly, why the *Epact* XXIX, be affixed to be the ſecond Day of *January*; the *Epact* XXVIII to the third Day, and thus all the reſt by Retrogradation.

To which I anſwer, that the *Epact* XXIX is thus affixed to the ſecond Day of *January*, becauſe ſuppoſing the laſt Lunation of the preceding Year, had ended the ſecond of *December*, there will remain 29 Days of the ſame Month; and therefore the *Epact* of the following Year is XXIX. For as the *Epact* belonging to each Year, denotes in their proper Place, the Days, in which the New *Moons* happen, throughout the Courſe of that Year, it is neceſſary the *Epact* XXIX be placed oppoſite to the ſecond Day of *January*; for from the Suppoſition, or Hypotheſis, that there is ſuch a Thing as *Epact* XXIX, the firſt Day of *January* muſt be the thirtieth, or laſt Day of the preceding Lunation; and thus the New *Moon* will happen the ſecond Day of *January*, to which will be affixed the *Epact* of that Year XXIX.

In the ſame Manner, oppoſite to the third of *January*, is placed the *Epact* XXVIII, becauſe after the Lunation ended the third Day of *December*, there remain 28 *Epactal* Days, of which, by adding the firſt and ſecond Day of *January*, will be made a whole Lunation of 30 Days; and therefore the New *Moon* will fall on the third Day of the ſame *Month*.

The reſt of the *Epacts* proceed in the ſame Order, till we come to the 30*th* of *January*, when the propoſed *Epact* I, is found; becauſe after the Lunation ended the 30*th* of *December*, there remains only one Day of *Epact*, viz. the 31ſt Day of *December*; ſo that the firſt Day of *January* is the firſt Day of the Lunation which begins the 31ſt of *December*, and ends the 29*th* of *January*, that *Epact* I, affix'd to the 30*th*, may indicate the New *Moon*.

It might be aſk'd, 3*dly*, why, in thoſe Months wherein there is made an Interruption of ſix Days, in the ſame Place, with the *Epact* XXVI, is plac'd in a different Character, the *Epact* 25? And why, likewiſe, in other Months, the ſame *Epact* 25, is plac'd with the *Epact* XXV?

I anſwer, that this is done becauſe within the Space of 19 Years, the New Moons are not to fall twice in the ſame Day, according to the Rules of the *Metonick* Cycle of nineteen Years; whence, if within the ſame Cycle of nineteen Years the *Epacts* XXIV and XXV happen, for XXV muſt be taken, mark'd in another Character, as plac'd firſt; without there could be any Danger of the New Moon falling twice in the ſame Day; becauſe if the *Epacts* XXIV and 25 are found in one Cycle, the *Epact* XXVI, which is in the ſame Place with 25, will have no Place in that Cycle.

It is aſk'd, 4*thly*, why oppoſite to the 31*ſt* Day of *December*, beſides the *Epact* XX, be added, the *Epact* 19 in other Characters?

I anſwer, that the *Epact* 19 is but very ſeldom us'd, and only when the *Golden Number* 19 concurs with the *Epact* XIX; for while the *Golden Number* 19 is running, the laſt Lunar Month, which is *embolifmick*, contains only, as we have already obſerv'd, 29 Days, tho' 30 be attributed to it; but becauſe of the Equation, XII Days are given to the following *Epact*, in lieu of XI that it ſhould have.

Therefore if XII be added to *Epact* XIX, they'll make up XXXI; whence XXX being thrown out, there will remain I, and the *Epact* of the following Year will be I; but the *Epact* I, anſwers to the 30*th* of *January*; wherefore, as the *Epact* XXIX pertains only to the 2*d* Day of *December*, and not to any other Day of the ſame Month; and as the *Epact* of the following Year will be I, which is affix'd to the 30*th* of *January*: Hence it would follow, that there could be no New Moon indicated between the 2*d* Day of *December* and the 30*th* of *January*; *i. e.* within 59 Days, tho' a New Moon happens the 31*ſt* of *December* of the ſame Year. Hence it happens, that to that ſame Day, beſides *Epact* XX, is aſcrib'd another, in another Character, *viz.* 19, which is the only one uſeful, the *Golden Number* 19, and the *Epact* XIX, concurring together no otherwiſe.

This is the Diſpoſition of the *Roman Calendar* after the Correction of Pope *Gregory* XIII; whence it happen'd, that the Connexion of the *Golden Numbers*, and of *Epacts*, is not perpetual, but is to be chang'd as often as a Lunar or Solar Equation is requiſite. For Example, the *Golden Number* 6, which anſwer'd to the Year 1582, being connected with the *Epact* VI, that *Epact* VI, is the *Epact* of the Year 1582 in the old *Calendar*; but after ten Days have been retrench'd, by the *Gregorian* Reformation, the *Epact* muſt be taken ten Degrees lower, in the Columns of the Months, under the *Golden Number* 6, *viz. Epact* XXVI, which *Epact* is to be join'd with the *Golden Number* 6; as in the following Table.

Golden Number	Epacts	Golden Number	Epacts	Golden Number	Epacts
6	XXVI	11	XXI	17	XXVII
7	VII	12	II	18	VIII
8	XVIII	13	XIII	19	XIX
9	XXIX	14	XXIV	1	I
10	X	15	V	2	XII
		16	XVI	3	XXIII
				4	IV
				5	XV

Therefore to the Year 1582 muſt have been given the firſt Place, in which is the Number 6, and the *Epact* XXVI; to the Year 1583 the ſecond, in which is the *Golden Number* 7, and the *Epact* VII, and ſo of the following Numbers and *Epacts*: So that the Year 1600 muſt anſwer in the old *Calendar* to the laſt Place, in which is the *Golden Number* 5, and the *Epact* XV; and the Year 1601 returns to the firſt Place, the Year 1602 to the ſecond, *&c.*

But becauſe in the Year 1700 there was omitted a biſſextile, or intercalary Day, the New Moons happen'd later; therefore, to make up the Equation, the Cycle of the *Epacts* muſt have deſcended a Degree lower towards the End of the Months; and whereas the laſt Moon of the Year 1700 ſhould have ended the twenty-firſt of *December*, ſo that there had remain'd ten Days of *Epacts*, and the New Moon had happen'd the twenty-ſecond; by the Omiſſion of the intercalary Day, the laſt Moon ended only the twenty-ſecond, and the New Moon happen'd the twenty-third of the ſame Month; whence the *Epact* was IX, not X; but as the *Golden Number* 10 was appropriated to that Year, a new Series of *Epacts* was inſtituted.

In the Year 1800 will be omitted, likewiſe, an intercalary Day, and every 300 Years the Moon is to anticipate the *Epacts* by one Day; therefore by that Compenſation made, there will be an Equation, tho' the ſame Cycle remains. This is the *Canon* of the *Epacts* from the Year 1700, incluſively, to the Year 1900, incluſively; which Canon anſwers to the Index *C* in the general Table of the *Epacts*.

To the Year 1700 is to be attributed the firſt Place, in which is the *Golden Number* 10, and the *Epact* IX; to the Year 1701 belong the ſecond, *&c.* ſo as for the Year 1718 to fall in the laſt, in which is the *Golden Number* 9, and the *Epact* XXVIII; and for the Year 1719 to return to the firſt, and thus ſucceſſively to the Year 1900, excluſively; thereby the *Golden Number* will be eaſily found, as well as the *Epact* of every Year propos'd, from the Year 1700, incluſively, to the Year 1900, excluſively.

Golden Number	Epacts	Golden Number	Epacts	Golden Number	Epacts
10	IX	17	XXVI	3	XXII
11	XX	18	VII	4	III
12	I	19	XVIII	5	XIV
13	XII	1	*	6	XXV
14	XXIII	2	XI	7	VI
15	IV			8	XVII
16	XV			9	XXVIII

In the Year 1900 there will be omitted an Intercalation, therefore it will deſcend to the Series of the Letter *B*. In the Year 2000, and 2100, the ſame Series will be continu'd. In the Year 2200 it will deſcend to the Series of the Index *A*. In the Year 2300 the Deſcent will be to the Series of the Index *V*. In the Year 2400 it will aſcend to the Letter *A*. In the Year 2500 it will deſcend back again to *V*, *&c.*

In all theſe there are three Rules to be obſerv'd: The firſt, that when an Intercalation is omitted, and there is no Anticipation of the Moon, there muſt be a Deſcent to the lower Series. The ſecond, that when an Anticipation of the Moon happens, and there is no Intercalation omitted, there muſt be an Aſcent to the ſuperior Series. The third, that when the Omiſſion of the Intercalation, and the Anticipation of the Moon, concur together, there is a Compenſation made, and the ſame Series continues.

From this Theory of the *Calendar*, we'll proceed to its Uſe. The principal Uſe of the *Calendar*, is, that the moveable Feaſts may be referr'd, every Year, to their proper Time, and eſpecially *Eaſter*, on which all the others depend; but *Eaſter* depends on the XIV*th* Moon of the firſt Lunar Month, and the XIV*th* Moon is to be known by the *Epact*; therefore we'll include the Uſe of the *Calendar* in two Problems.

Prob. I. To find on any Day the Age of the Moon.

1. The *Epact* of the current Year muſt be found, by means of the preceding Canon, in Uſe from the Year 1700, incluſively, to the Year 1900, excluſively; for afterwards we ſhall be oblig'd to uſe the other Canons, or Series, taken from the general Table of *Epacts*. Having found the *Epact*, it will indicate, in the *Calendar*, every Day of the Year in which the New Moons are to happen; whence the New Moons, and Quadratures, will be known. For Example, the *Epact* for the Year 1700 was IX, therefore whereever, in the monthly Tables, this Number IX occurr'd, there was indicated the Beginning of the Lunations of that Year, *viz.* at the 22*d* of *January*, at the 20*th* of *February*, &c. The ſame is to be obſerv'd in the other Years.

What I ſay of the Days of the New Moons being indicated by the *Epact*, I would not have it underſtood that it can be done with the ſame Accuracy as by the aſtronomical *Calculus*; for the Moon which, in the Style of the *Calendar*, is call'd the XIV*th*, is oftner the XV*th*, and the Equinox later deſign'd than it ſhould be; but the Church likes beſt to recede a little from the true Equinox, than to anticipate it; leſt *Eaſter* ſhould be celebrated on the Day of the Equinox, or even before the Equinox.

Therefore the Church uſes, in its *Calendar*, a political *Calculus*, adapted to the Manner of reckoning of the People, and not of an accurate and aſtronomical one; and as we have not always a *Calendar* in Hand, another Method, ſtill leſs accurate, has been invented, to find, at any Time, the Age of the Moon.

The *Epact* of each Year, is the Number of Days of the Moon left of the preceding Year, or the Age of the Moon at the firſt Day of *January*; which if found for any Year given, it will be found for the next following, and all other Years, by the continual Addition of XI Days, throwing out XXX, every Time they occur, till the *Golden Number* 19 happens; at which Time, the *Epact* XII muſt be taken, by reaſon of the *Leap* of the Moon.

Therefore where the *Epact* happens to be mark'd, ſo many Days muſt be added to it as the Month, in which the Age of the Moon is ſearch'd, or look'd for, is diſtant, in Number, from the Month of *March*, reckoning *March* it ſelf; for by ſuch Addition, there will be had the Age of the Moon for the firſt Day of that Month: Therefore, if to that Number be added, beſides, the Number of Days already elaps'd of that ſaid Month, thoſe 3 Numbers, *viz.* the *Epact*, the Number of Months from *March*, and the Number of Days of the Month propos'd, which being collected together, will exceed XXX, or not; if they don't exceed XXX, they'll indicate the Age of the Moon; but if they exceed XXX, the XXX are to be thrown out, and the Number left will indicate the Age of the Moon. *V. gr.* If we would know the Age of the Moon for the 17*th* of *November* for the Year 1700; the *Epact* IX, which is adapted to that Year, muſt be taken, then the Number of the Days of the Month, *viz.* 17; and the Number of Months from *March* to *November*, *viz.* 9; which Numbers being added together, will give 35: Whence, if XXX be ſubſtracted, there will remain V; which indicates the Age of the Moon for that Day.

If it be aſk'd why the Computation begins at *March*, and not at *January*? I anſwer, that the Month of *January* conſiſts of 31 Days, and the Moon anſwering to it of 30; but that the Month of *February* has but only 28 Days, and the Moon 29; whence, after thoſe two Months a Compenſation is made; ſo that the Solar Year in no manner exceeds the Lunar one, at the Beginning of *March*: Therefore the XI Days, by which the Solar Year exceeds the Lunar one, are diſtributed throughout the other Months: Conſequently the Computation muſt begin from the Month of *March*. Tho', as we have already obſerv'd, this Method is erroneous; neither can the Solar Months be always adapted to the Lunar Months anſwering to them; but there is no ſuch accurate *Calculus* requir'd in common Uſe.

Prob. II. To find the moveable Feaſts every Year.

The other Feaſts depend on *Eaſter*, and have their deſin'd Intervals from *Eaſter*: For if in the Tables of the Months we mark *Eaſter* Day, and we go from it ſix Weeks towards the Beginning of the Year, we ſhall have the firſt *Sunday* of *Lent*. Therefore the *Wedneſday* antecedent to it will be *Aſh-Wedneſday*, which is preceded by the *Sunday* of *Quinquageſima*; the *Quinquageſima* by the *Sexageſima*; and the *Sexageſima* by the *Septuageſima*: For the Denomination of theſe *Sundays* is taken from the *denary Progreſſion* obſerv'd in Arithmetick, tho' there be but 7 Days between them. The *Septuageſima* being known, it is eaſy to find how many *Sundays* there are between *Septuageſima* and the Feaſt of the *Epiphany*, which Feaſt is fix'd immoveable, at the 6*th* Day of *January*.

If we reckon 7 Weeks after *Eaſter*, in which are contain'd 49 Days, we ſhall find, at the End of thoſe 7 Weeks, the Feaſt of *Pentecoſt*, or the 50*th* Day after *Eaſter*, which was a ſolemn Day in the Old Teſtament, and much more ſo in the New, by the coming of the *Holy Ghoſt*.

At preſent, we muſt find the Number of Weeks between the Feaſt of *Pentecoſt* to the 25*th* of *December*, on which Day falls the Feaſt of *Chriſt*'s Nativity. The 4*th Sunday* before that Feaſt, is the firſt *Sunday* in *Advent*; therefore the Number of *Sundays* between *Pentecoſt* and the firſt *Sunday* in *Advent*, is conſpicuous enough; and therefore *Eaſter* once found, it is very eaſy to find all the other moveable Feaſts.

Eaſter, by a Decree of the Council of *Nice*, is to be celebrated the *Sunday* next after the XIV*th* Moon of the firſt Lunar Month. The Reaſon of this Inſtitution is taken from *Exod.* xii. where the *Jews* are commanded to celebrate the *Paſſover* in the XIV*th* Moon of the firſt Month; that they might preſerve the Memory of that fortunate Day when they were deliver'd from the Captivity of *Egypt*, and recover'd their

their Liberty. Therefore the *Chriſtians* muſt celebrate the Feaſt of the *Reſurrection* the next *Sunday* following the XIV*th* Moon, on which Day, *Chriſt*, by riſing from the Dead, deliver'd us from the Tyranny of the Devil.

Therefore the Month whoſe XIV*th* Moon falls on the vernal Equinox, or is the firſt from it, that Month is by divine Inſtitution the firſt Lunar Month. Whence four Things are to be obſerv'd in this Place, 1. The *Spring*. 2. The *New Moon*. 3. The XIV*th Moon*. 4. The *next Sunday* following the XIV*th Moon*.

The *Spring*, or vernal Equinox, is commonly referr'd to the 21*ſt* of *March*, tho' it ſometimes precedes that Day, as it happen'd towards the End of the 17*th* Century; but by the Omiſſion of the biſſextile Day, the Equinox was reſtor'd, in 1700, to the 21*ſt* of *March*. The *New Moon* is the firſt Day of the Lunar Month. The XIV*th Moon* is the 14*th* Day of the Lunar Month. The *Sunday* next to the XIV*th Month*, is that *Sunday* which follows immediately after.

Therefore if the New Moon happen'd the 8*th* of *March*, the 14*th* Day of that Moon would fall on the 21*ſt* Day of the ſame Month, or on the Equinox; for the Church always refers the Equinox to the 21*ſt* of *March*: Therefore if that 21*ſt* Day happen'd to be a *Saturday*, *Eaſter* will be celebrated the next Day following, *i. e.* the 22*d* of *March*, and the 15*th* of the firſt Moon, as it was celebrated in the Year 1693. But if the 21*ſt* Day be a *Sunday*, *Eaſter* is not to be celebrated till the *Sunday* following, which is to be the 28*th* of *March*, and the 21*ſt* of the firſt Moon, or Lunar Month; in which Lunar Month there are 7 Days, which ſerve alternately to the Solemnity of *Eaſter*, *viz.* from the XV*th* to the XXI*ſt*.

But if the New Moon happen'd before the 8*th* of *March*, *v. gr.* if it happen'd the 7*th*, then the XIV*th* Moon would fall on the 20*th* of *March*; and therefore by its having preceded the Equinox, could not be the *firſt*, or *Paſchal Moon*, at leaſt as decreed by the Church, but the Solemnity would be deferr'd to the next, which begins the 5*th* of *April*.

Therefore the New Moons, whoſe XIV*th* Moon falls on the vernal Equinox, or follows it next, are in Number 29, *viz.* from the 8*th* of *March*, incluſively, to the 5*th* of *April*, alſo, incluſively, but the XIV*th* Moon of the firſt New Moon falls on the vernal Equinox, and thoſe of the other Moons, in their Order, after the Equinox; therefore the Solemnity of *Eaſter* runs thro' 35 Days, from the 22*d* of *March*, incluſively, to the 25*th* of *April*, incluſively; *i. e.* it can fall on any of thoſe 35 Days. For if the New Moon happens on the 8*th* of *March*, and the XIV*th* Moon falls on the 21*ſt* Day of *March*, perhaps a *Saturday*, the *Feaſt of the Reſurrection* will be celebrated the next Day, *viz.* the 22*d* of *March*, and the XV*th* Moon. But if the New Moon happens the 5*th* of *April*, and the XIV*th* Moon falls on the 18*th* of the ſame Month, perhaps a *Sunday*, *Eaſter* will not be celebrated the ſame Day, leſt the *Chriſtians* ſhould appear to concur with the *Jews*, or *Quartodecimains*; but muſt be deferr'd to the *Sunday* following, *viz.* the 25*th* of *April*, and the XXI*ſt* Moon.

Eaſter Day will be found, for any Year, by the *Epact* current, and obſerving in the *Calendar* to which Day it is prefix'd, from the 8*th* of *March*, incluſively, to the 5*th* of *April*, alſo, incluſively. Since that *Epact* indicates the New Moon for that whole Year, if 14 Moons, or 14 Lunar Days, be reckon'd from it, and the following *Sunday* be known by the *Dominical Letter*, the Feaſt of *Eaſter* will be found. *V. gr.* In the Year 1693, the *Epact* was XXIII, which was that oppoſite to the 8*th* of *March*; therefore the Days, or 14 Moons, muſt have been reckon'd from the 8*th* Day of *March*, and the 14*th* muſt have fell on the 21*ſt* of the ſame Month, to which anſwer'd the Letter *C*, which that Year indicated *Saturday*; therefore there muſt have been a Deſcent to the Letter *D*, which was the *Dominical*, and which anſwer'd to the following Day, the 22*d*; on which Day *Eaſter* was, that Year, celebrated. In the Year 1700, the *Epact* was IX, which was prefix'd to the 22*d* of *March*; from that Day, in which the New Moon happen'd, muſt have been reckon'd 14 Days, and the 14*th* fell on the 4*th* of *April*, which was a *Sunday*, becauſe mark'd with the Letter *C*, which, that Year, was the *Dominical Letter*; therefore the Celebration of *Eaſter* was deferr'd to the *Sunday* following, which was the 11*th* of *April*.

But *Eaſter-Day* can be found, with leſs Difficulty, in the *Perpetual Paſchal Table reform'd*. In that Table there are four Columns: The firſt contains the *Golden Numbers*; the ſecond all the *Paſchal Epacts*, viz. from the 8*th* of *March*, incluſively, to the 5*th* of *April*, alſo, incluſively; which are us'd, inſtead of *Golden Numbers*, in the new *Calendar*. The third, the *Dominical Letters*, from the 22*d* of *March*, incluſively, to the 25*th* of *April*, likewiſe incluſively. The fourth, the Days of thoſe Months in which *Eaſter* is to be celebrated; if there be more in that Column, they pertain to the other *moveable Feaſts*.

Therefore, the *Epact* being known, we muſt look for the *Dominical Letter* next following, and we ſhall find it oppoſite to the Day of the Month on which *Eaſter* falls. *V. gr.* In the Year 1699 the *Epact* was XXIX, and the *Dominical Letter D*; therefore I ſearch the *Epact* XXIX, in the Table of the *Epacts*, and under it the *Dominical Letter D*, next following, which anſwers to the 19*th* of *April*; whence I infer, that *Eaſter* happen'd, in 1699, on the 19*th* of *April*.

The antient PASCHAL TABLE *reform'd*.

Golden Number	Cycle of Epacts	Dom. Let.	Eaſter
XVI	XXIII	c	
V	XXII	d	*March* 22
	XXI	e	23
XIII	XX	f	24
II	XIX	g	25
	XVIII	A	26
X	XVII	b	27
	XVI	c	28
XVIII	XV	d	29
VII	XIV	e	30
	XIII	f	31
XV	XII	g	*April* 1
IV	XI	A	2
	X	b	3
XII	IX	c	4
I	VIII	d	5
	VII	e	6
IX	VI	f	7
	V	g	8
XVII	IV	A	9
VI	III	b	10
	II	c	11
XIV	I	d	12
III	*	e	13
	XXIX	f	14
XI	XXVIII	g	15
	XXVII	A	16
XIX	25.XXVI	b	17
VIII	XXV.XXIV	c	18
		d	19
		e	20
		f	21
		g	22
		A	23
		b	24
		c	25

The Uſe of the new *Paſchal Table* ſeems yet a great deal eaſier. In its firſt Column are plac'd the ſeven *Dominical Letters*; in the ſecond all the *Epacts* which occur; then oppoſite to the *Epacts* are mark'd, in the other Columns, not *Eaſter* only, but alſo all the other moveable Feaſts. For Example,

In the Year 1707, the *Dominical Letter* was *B*, and the *Epact* XXVI; therefore if you ſearch the Letter

B, in the firſt Column of the Table, and the *Epact* 26, after the Letter *B*, in the ſecond Column, you'll find, oppoſite to that *Epact*, that the *Septuageſima* happen'd, that Year, on the 20*th* of *February*, *Eaſter* the 24*th* of *April*, and the firſt *Sunday* in *Advent* the 27*th* of *November*.

In the Biſſextile Years, the moveable Feaſts are found by the *Dominical Letter* current, after the Feaſt of St. *Matthias*; ſo that one Day muſt be added to the *Septuageſima*, and to *Aſh-Wedneſday*. Thus, in the Year 1712, *B* was the *Dominical Letter* current after the Feaſt of St. *Matthias*; therefore oppoſite to the *Epact* 22 current for the ſame Year, will be found the *Septuageſima*, mark'd the 23*d* of *January*, and *Aſh-Wedneſday* the 9*th* of *February*; whence you'll conclude, that the *Septuageſima* happen'd that Year on the 24*th* of *January*, and *Aſh Wedneſday* on the 10*th* of *February*. Nothing ſhould be added, if *Aſh-Wedneſday* was to happen in *March*.

In the *Julian* Way of computing, no Full Moon is Paſchal, but that immediately after the 21*ſt* of *March*; therefore *Eaſter* can never happen earlier than the 22*d* of *March*. Now by finding the Full Moons next after the 21*ſt* of *March*, for the ſeveral *Golden Numbers*, or Years of the Lunar Cycle, we ſhall have a Table for the finding of *Eaſter* for ever. Such Table being of conſiderable Uſe in the *Julian* Computation, we ſhall here ſubjoin it.

Golden Number	Full Moons next after the Vernal Equinox		Golden Number	Full Moons next afte the Vernal Equinox	
I	5 *April*	D	XI	15 *April*	G
II	25 *March*	G	XII	4 *April*	C
III	13 *April*	E	XIII	24 *March*	F
IV	2 *April*	A	XIV	12 *April*	D
V	22 *March*	D	XV	1 *April*	G
VI	10 *April*	B	XVI	21 *March*	C
VII	30 *March*	E	XVII	9 *April*	A
VIII	18 *April*	C	XVIII	29 *March*	D
IX	7 *April*	F	XIX	17 *April*	B
X	27 *March*	B			

Now to find *Eaſter* for any given Year, find the *Dominical Letter*, and the *Golden Number* of the given Year, as heretofore directed; then in the Table ſeeking the *Dominical Letter*, with the Day of the Paſchal Full Moon, and the *Sunday* Letter annex'd thereto; compare this Letter with the *Dominical Letter* of the given Year, that it may appear how many Days are to be added to the Day of the Paſchal Full Moon.

But in this Computation, the vernal Equinox is ſuppos'd affix'd to the 21*ſt* of *March*, and the Cycle of 19 Years, or *Golden Numbers*, is ſuppos'd to point out the Places of the New and Full Moons exactly; both which are erroneous: Whence it follows, that the *Julian Eaſter* never happens at its due Time, unleſs by Accident.

Calendar, is alſo us'd for the Catalogue, or *Faſti*, antiently kept in each Church of the Saints, both univerſal, and thoſe particularly honour'd in each Church, with their Biſhops, Martyrs, *&c.* The *Calendars* are not to be confounded with Martyrologies, for each Church had its peculiar *Calendar*; whereas the Martyrologies regarded the whole Church in general, containing the Martyrs and Confeſſors of all the Churches. From all the ſeveral *Calendars* was form'd one Martyrology, ſo that Martyrologies are poſterior to *Calendars*.

There are ſtill ſome of theſe *Calendars* extant, particularly a very antient one of the Church of *Rome*, made about the Middle of the 4*th* Century; comprehending, alſo, the Feſtivals both of the *Heathens* and *Chriſtians*, which were then very few in Number. F. *Mabillon* has alſo printed the *Calendar* of the Church of *Carthage*, made about the Year 483. The *Calendar* of the Church of *Æthiopia*, and that of the *Cophtæ*, publiſh'd by *Ludolphus*, ſeem to have been made after the Year 760. The *Calendar* of the *Syrians*, printed by *Genebrard*, is very imperfect; that of the *Muſcovites*, publiſh'd by F. *Papebroch*, in moſt Reſpects agrees with that of the *Greeks*, publiſh'd by *Genebrard*. The *Calendar* publiſh'd by *Dom. D'Achery*, under the Title of the *Solar Year*, is no more than the *Calendar* of the Church of *Arras*. The *Calendar* publiſh'd in 1687, at *Augſbourg*, by *Beckius*, is apparently that of the antient Church of *Augſbourg*, or rather *Straſbourg*, wrote towards the Cloſe of the 10*th* Century. The *Moſarabick Calendar*, ſtill us'd in the five Churches of *Toledo*; the *Ambroſian* of *Milan*, and thoſe of *England* before the Reformation, have nothing in them but what's found in thoſe of the other weſtern Churches.

CALVINISM.

CALVINISM, is the Doctrine of *Luther* and *Zuingle*, modeliz'd by *Calvin*, and by him adapted to his own Sentiments; but as *Calviniſm* owes its Origin to *Zuingle*, rather than to *Luther*, from whoſe Doctrine it differs in ſeveral eſſential Articles, as we'll ſee in the Sequel of this hiſtorical Account of *Calviniſm*, we muſt, previouſly to it, inform our ſelves who was *Zuingle*, of his Doctrine, and how it was firſt eſtabliſh'd.

Haudry Zuingle was a young Man, endu'd with extraordinary good natural Parts, and of a fiery Temper, who from the Army, where he had ſerv'd with ſome Reputation, retir'd into the Sanctuary, and became Prebend of the Church of *Conſtance*, which he quitted alſo, to follow *Luther*, who then began to preach his Doctrine.

Zuingle was ſent, by his new Maſter, *Luther*, to *Zurich* in *Switzerland*, where he contented himſelf, at firſt, to preach againſt the Indulgences which a *Milaneſe Cordelier*, or grey Fryar, was come to publiſh at *Zurich*, and againſt the Tyranny of the Popes, eſpecially with regard to the Celibacy of the Clergy, which *Zuingle* had already condemn'd by his Example, by changing his Prebend for a Wife; but conſidering afterwards that he had as much Right to make himſelf the Chief of a new Church in *Switzerland*, as *Luther* had done in *Germany*, he took, on the other moſt eſſential Articles, a Road quite contrary to that of *Luther*; for *Luther* makes our Salvation to depend entirely on the Grace of God, and leaves nothing to the Free-will; while, on the contrary, *Zuingle* turn'd *Pelagian*, gives all to the Free-will, pretending, *Lib. De Provid. c.* 6. that we can operate our Salvation by our natural Strength; and believing, *in Expoſ. Fid. Chriſt.* that *Cato*, *Socrates*, *Scipio*, *Seneca*, and even *Hercules* and *Theſeus*, and the other like Heroes of *Paganiſm*, had merited Heaven by their heroical Actions. *Luther* has always believ'd the real

Preſence of *Chriſt*, in the Euchariſt, but not the Tranſubſtantiation; *i. e.* he would have the Body of *Chriſt* to be really preſent in the Sacrament, without any Change, or Alteration, in the Subſtance of the Bread and Wine; but *Zuingle*, *Lib. De Euchariſt.* maintain'd, that nothing was receiv'd in the Sacrament but the Bread and Wine, which ſignified, and repreſented the Body of *Chriſt*, to which he that receiv'd was ſpiritually united by Faith.

Zuingle, having already form'd to himſelf a moſt powerful Party in *Zurich*, which the *Catholicks*, and particularly the Religious of the Order of St. *Dominick*, oppos'd ſtrenuouſly: An Aſſembly was convok'd by the Senate of that City, to hear both Parties, in a regular Diſpute, and to judge ſovereignly afterwards, by the *Word of God*, of their Differences.

The Biſhop of *Conſtance*, in whoſe Dioceſe *Zurich* was, frighted at this Enterprize, which he thought unwarrantable, as being without Precedent; ſent his *grand Vicar*, *John Faber*, to forbid them to proceed farther, and remonſtrate to them how monſtrous it was, and contrary to the antient Practice of the *Church*, for an Aſſembly of Laymen to uſurp the Authority of a Council, for the Deciſion of Points of Doctrine relating to Faith. But *Zuingle*'s Partiſans, who were much more in Number, anſwer'd, that as they had a greater Intereſt than any Body elſe in their own Salvation, they had alſo a greater Right than any others to enquire after the Truth; and the Queſtion being put to the Vote, the Doctrine of *Zuingle* was approv'd, and receiv'd by a great Majority, in the Canton of *Zurich*; and notwithſtanding the Remonſtrances of the Canton of *Lucerne*, the Images and Altars were ſoon after thrown down, which was follow'd by a publick Renunciation of the Communion of the *Roman Church.*

The Biſhops of *Baſil*, of *Conſtance*, and of *Lauzane*, ſurpriz'd at this Change, ſays *Sleidan*, *lib.* 6. which was follow'd by that of *Schaphouſe*, and which happen'd in 1525, prevail'd, by their frequent Intreaties, that a general Aſſembly, of all the Cantons, ſhould meet at *Baſil*, in 1526, where the famous Dr. *Eſkius*, having refuted all that *Œcolampadius* could ſay in Defence of the Doctrine of his Maſter *Zuingle*, who had ſent him to that Aſſembly, where he would not appear himſelf; that Doctrine was condemn'd by a ſolemn Decree, in the Name of the whole *Helvetick* Body. But thoſe of *Bern* having refus'd to receive that Decree, they convok'd another Aſſembly, where the *Roman Catholicks* refuſing to appear, becauſe that Affair had been already decided; and therefore *Zuingle* and his Partiſans, finding themſelves the ſtrongeſt, the ſame Thing was done in that Aſſembly, with Regard to the Doctrine of the *Church* of *Rome*, which was done at *Baſil*, with Regard to that of *Zuingle.* Some Time afterwards, thoſe of *Baſil*, perſuaded by *Œcolampadius*, follow'd that Example, and enter'd into a League with thoſe of *Zurich*, *Berne*, and *Schaphouſe.*

It is impoſſible that the Diverſity of Religion could not produce ſoon a Diviſion in the Hearts. Thoſe of *Zurich*, confiding in their Strength, far greater than that of their Neighbours, provok'd ſo often thoſe among them who refus'd to eſpouſe their Party, that the five Cantons, of *Lucerne*, *Zug*, *Uri*, *Underwald*, and *Shwitz*, to obtain Satisfaction for the many repeated Inſults they thought to have receiv'd from thoſe of *Zurich*, invaded their Territories; whence enſu'd a Battle, (continues *Sleidan*, *l.* 8.) which prov'd fatal to thoſe of *Zurich*, ſince their whole Army was cut in Pieces; and *Zuingle* himſelf, who was as brave a Soldier as eloquent Preacher, fighting gallantly at the Head of a Battalion, was kill'd on the Spot. The *Roman Catholicks* obtain'd over them ſeveral Advantages, in four or five other Combats; after which, a Peace was concluded, each enjoying the free Exerciſe of his Religion in the ſame Manner they enjoy it at this Day; with this Difference, that the *Zuinglian* Cantons, having aſſociated themſelves, ſince, with thoſe of *Geneva*, are become *Calviniſts.* Such was *Zuingle*, of whoſe Doctrine in Part, and that of *Luther*, has been form'd the *Calviniſm.*

Theſe two Reformers, who could never agree in their Sentiments, or rather Opinions; agreed, however, without having conſulted together, in the Deſign of gaining *Francis* I, King of *France*, to their Party. That Prince, call'd ſince *Le Pere des Lettres*, the Father of Learning, had lately invited the Learned from all Parts of *Europe*, into his Dominions. Therefore *Luther* wrote to him ſeveral Letters, in which he proteſted, that he had nothing elſe in View, but to purge the Church of the Abuſes which had been introduc'd into it, as ſo many dark Spots, which had eclips'd its Luſtre and Beauty, which he was determin'd to reſtore. He even engag'd *Frederick*, Elector of *Saxony*, to write to *Francis* in his Favour. He ſent him ſome of his Books, of thoſe which had a greater Appearance of Piety; and as he knew that the King receiv'd moſt graciouſly all the Learned, he took great Care, with *Philip Melanchthon*, to ſend into *France* the moſt learned young Men they had among them. *Zuingle*, on his Side, did the ſame Thing, and even went further, by dedicating to the King his Book of the true and falſe Religion.

The *Rendezvous* of thoſe Learned, of both *Sects*, was at *Straſburg*, near *Martin Bucer*, who was uncertain yet which of the two Opinions, of *Luther*, or *Zuingle*, he ſhould eſpouſe. But, however, he found the Secret to perſuade his Gueſts to forget, while in *France*, the Differences ſubſiſting between them, and even appear there, the better to gain their End, under the Name of *Catholicks.* Therefore, in a very ſhort Time, the Univerſity of *Paris* was fill'd with thoſe Foreigners, who ſoon acquir'd the Reputation, by ſpeaking *Greek* and *Hebrew*, of learned Men, and found the Secret to introduce themſelves into the Houſes of Perſons of Quality, who, by the King's Example, had a great Value for the Learned; and where they began to interpret the Bible, in a Manner different from the *Roman* Church, as more agreeable, in their Opinion, to the *Greek* and *Hebrew* Text.

Florimon de Remond, *l.* 7. and the Hiſtorian of the reform'd Churches, ſays, that the *Sorbon*, allarm'd at their Proceedings, ſent a Deputation of Doctors to the King, to remonſtrate to him, that *it was very much to be fear'd, that thoſe Grammarians came lately from a Country infected with Hereſy; would bring that Infection into* France, *by attempting, above their Profeſſion, to interpret the Bible as they pleas'd, under Pretence that they thought themſelves learned in* Greek *and* Hebrew. But the King, who then conſider'd in them but the valuable Quality of learned Men, far from minding thoſe Remonſtrances, forbad they ſhould be diſturb'd in the leaſt, for fear that it ſhould deter other learned Men from reſorting into *France.*

Therefore finding the King ſo well diſpos'd in their Favour, they began to publiſh their Doctrine, (then call'd the Sentiments of the *Beaux Eſprits*, and Learned) with a far greater Liberty than they had heretofore done. The Biſhop of *Meaux* was their firſt Proſelyte, of any Note; that Prelate was *William Briſſonet*, a Man of Quality, of Merit, and of an exemplary Life; and who, like the King, was very well diſpos'd in Favour of thoſe Doctors newly come from *Germany*, and who ſpoke of nothing elſe but of Reformation, of *Greek* and *Hebrew*, call'd near his Perſon thoſe among them who had acquir'd the greateſt Reputation, to govern his Dioceſe under him. The principal among theſe, and who can be juſtly conſider'd as the Precurſors of *Calvin*, were, ſays *Florimond de Remond*, *lib.* 7. *c.* 3. *William Farel*, of *Dauphiné*, *James Fabri*, or *Le Fevre*, *Arnaud*, and *Gerard Rouſſel*, of *Picardy*; all four Maſters of Arts, and had all four been Profeſſors in the Univerſity. Theſe four Philoſophers, under the Authority of their illuſtrious Protector, began to reform ſeveral Practices of Piety, which they repreſented as Abuſes; and to explain, in their own Manner, the ſacred Myſteries of the *Chriſtian*

ſtian Religion, throwing then the Foundations on that ſingle Dioceſe, of that Doctrine, which afterwards did ſpread all over the Kingdom of *France*.

In 1523, the Parliament of *Paris*, being inform'd of the Proceedings of theſe Reformers, which they thought highly prejudicial to the antient Religion, eſtabliſh'd in the Kingdom ever ſince the firſt *Chriſtian* King *Clovis*, appointed Commiſſaries, to inform againſt thoſe ſuppos'd Authors of the new Doctrine, which that auguſt Aſſembly ſtil'd, ſays M. *Maimbourg*, a Crime of high Treaſon againſt God, *Crimen læſæ Majeſtatis Divinæ*. This Arreſt of the Parliament, continues the ſame Author, was a Clap of Thunder, which frighten'd ſo much theſe new Miniſters of the Goſpel, that, inſtead of expoſing themſelves, like good Shepherds, for their ſmall Flock, and of pretending to the Glory of having been the firſt Martyrs of their new Sect; they all fled into *Germany*, leaving their Protector in the Lurch; who, to ſhelter himſelf againſt the Tempeſt which he ſaw hanging over his Head, condemn'd, in a Synod, the Books of *Luther*, and made ſeveral Regulations, to maintain the antient Practices of the Church in his Dioceſe. For my Part, I am ſurpriz'd that I do not find in the Critick of *Maimbourg*'s Hiſtory of *Calviniſm*, that the Author endeavours to excuſe that precipitated Flight of thoſe four Miniſters; which, in my Opinion, is a moſt eſſential Point: For Puſillanimity has never been conſider'd as an apoſtolical Characteriſtick; and a becoming Intrepidity on that Occaſion had ſtrengthen'd their new Proſelytes in their Faith, and perhaps hinder'd the Parliament of *Paris* from purſuing them, *vi & armis*, and their Protector among the reſt, who, notwithſtanding his Recantation, was by an Arreſt of that auguſt Aſſembly, iſſu'd the 3*d* of *October*, 1525, *order'd to be examin'd, and interrogated by Meſſieurs* James Meſnager, *and* Andre Verjus, *Counſellors of the Court, on the Facts contain'd in the Informations, which will be put before the Judges appointed by the holy See for the Trial of thoſe nam'd in the Arreſt*. Regiſt. du Parliam. Proofs of the Liberty of the *Gallick Church*, c. 35.

This *Arreſt* was confirm'd by another of the 25*th* of the ſame Month; and tho' the Biſhop had pray'd the Court that he might be heard, all the *Chambers aſſembled*, he was oblig'd to undergo the *Interrogatory*, in which, 'tis certain, that he very well juſtified himſelf of all that had been imputed to him, and eſpecially of having granted his Protection to *Hereticks*.

But, however, all theſe *Arreſts* of the Parliament of *Paris* could not hinder the new Doctrine from making vaſt Progreſs, eſpecially under the powerful Protection of the Dutcheſs of *Alençon*, *Marguerite of Valois*, the King's Siſter, who was then but 27 Years of Age, tho' Widow of the laſt Duke of *Alençon*, kill'd at the Battle of *Pavia*, where he commanded the Rear Guard. This young Princeſs had an excellent Genius, a great Soul, a ſolid and clear Judgment, a Dexterity above her Sex, for the Management of the moſt intricate Affairs; a great deal of natural Beauty, which made her belov'd by every Body, eſpecially the King her Brother, who had always for her all the Tenderneſs, and Conſideration, that a Brother could have for ſo accompliſh'd a Siſter, by whom he was perfectly belov'd. She had, beſides, a very great Curioſity, natural to her Sex, to know the Secrets of the new Doctrine, which made her eaſily prevail'd upon to hear favourably the new Miniſters, whoſe Writings ſhe had read already with ſome Satisfaction. She commended, then, their Zeal and Piety, and approv'd of their Conduct; and had ſoon, according to their Advice, her Prayer-Book tranſlated into *French*, by the Biſhop of *Saulis*, the King's Confeſſor.

While *Marguerite* was in this Diſpoſition, ſays the Author of the Hiſtory of *Navarre*, *c.* 13. the King gave her in Marriage to *Henry D'Albert*, King of *Navarre*, whom he promis'd, in Favour of this Marriage, to aſſiſt in the Recovery of his Kingdom uſurp'd by the *Spaniard*, under the ſcandalous Pretence that it had been given him by Pope *Julius* II, declar'd Enemy of *France*, who had excommunicated *John of Albert*, King of *Navarre*, and given his Kingdom to *Ferdinand of Arragon*, becauſe *John* had enter'd into an Alliance with *Lewis* XII, King of *France*, and refus'd Paſſage thro' *Navarre* to the *Arragonois*, to invade *France*; which monſtrouſly ſcandalous *Bull* of Excommunication was always conſider'd as abuſive, in *France*, and contributed much toward engaging *Henry*, Son of *John*, who had been depriv'd of his Kingdom in Conſequence of that villainous *Bull* of Tyranny and Uſurpation, to grant his Protection to the new Reformers, who attack'd, in a particular Manner, the Power and Authority of the Popes.

Therefore the Queen of *Navarre* being departed with her Huſband, for *Bearn*, a few Days after the Celebration of her Nuptials at St. *Germain en Laye*, in 1527; receiv'd ſeveral of them at her Court, and, in particular, *James Fabri*, and *Gerard Ruſſel*. As *Ruſſel* had a great deal of Wit and Dexterity, his Conduct was very regular, and he us'd to preach with much Piety and Devotion, and was, beſides, very charitable to the Poor; being follow'd always by a vaſt Number of them, who call'd him their Father. He was ſoon conſider'd and reſpected as a *Saint*, and knew ſo well how to inſinuate himſelf into the Queen's Favour, ſays *Florimon de Remond*, that ſhe took him for her Director, gave him the Abby of *Clairac*, and made him Biſhop of *Oleron*. He us'd to preach three Times in one Day, but preach'd a Doctrine different, in ſeveral Points, from that of the *Roman* Church, tho' he was, properly ſpeaking, nor *Lutheran*, nor *Zuinglian*; he aſſiſted regularly to all the *canonical Hours*, and ſaid Maſs. But he would have always that Part of the People ſhould take the Sacrament with him, under both Kinds. He us'd to teach the People, expoſing to them, before the Communion, the Myſtery of the *Euchariſt*; that *Chriſt* is preſent in that Sacrament, which is contrary to *Zuingle*'s Opinion; but he ſaid, alſo, that he was only preſent there in a certain Body, which he imagin'd of a Nature between the ſpiritual and material, without Bones and Fleſh; which is a Doctrine different from that of the *Catholicks* and *Lutherans*, who confeſs, in that Sacrament, the ſame Body which *Chriſt* had upon Earth. He had gain'd ſo great an Aſcendant over the Queen, that he perſuaded her to read the Bible in *French*, and eſpecially the New Teſtament, which, ſay the *Roman Catholicks*, was falſified by an unfaithful Traduction, in which ſhe took ſo much Pleaſure, that ſhe made it the Subject of ſome dramatick Pieces, which ſhe had repreſented before the whole Court by Comedians, who, to pleaſe her, us'd to intermix them with ſome Satires and Farces, againſt the Eccleſiaſticks and Monks, and particularly againſt the Popes; which oblig'd, at laſt, the Cardinals of *Foix*, and of *Grammont*, who could no longer ſtay at the Court with Honour, to leave it.

This Princeſs being, as we have already obſerv'd, tenderly belov'd by the King of *France*, her Brother, undertook to gain him in Favour of her new Miniſters; whom ſhe us'd continually to praiſe before him, as honeſt, learned, and quiet Men, who had no other Intereſt than that of the Truth, and of God's Glory, which they were endeavouring to promote, by the Reformation of Manners, and the Suppreſſion of ſeveral Abuſes and Superſtitions, which had been introduc'd into the Church. She was ſeconded, in this Undertaking, by ſome Ladies of the *French* Court, particularly by the *Dutcheſs of Eſtampes*, who was then the King's Favourite, and perhaps ſomething more. Theſe Ladies us'd to vaunt to the King certain Preachers of *Paris*, who, for their florid Eloquence, and profound Erudition, were always follow'd by a vaſt Concourſe of People, and, in particular, one *Le Coq*, or *Cock*, Curate of St. *Euſtach*, who us'd to diſclaim continually againſt *Luther*, blaming him for having caus'd a Schiſm in the Church, between whoſe Members, he pretended, there ought to be always a perfect Union;

Union; hoping thereby, says *Maimbourg*, to preserve the Reputation of zealous *Catholick*, and to be more at Liberty to preach his new Doctrine, which he call'd the Doctrine of the Church.

This the King consented to hear, who having been inform'd of the Honour he was to have of preaching before the King, and the whole Court, took for the Text of his Sermon, this Passage of St. *Paul* to the *Colossians*, *c.* iii. *v.* 1, 2. *If ye then be risen with Christ, seek those Things which are above, where Christ sitteth on the right Hand of God. Set your Affection on Things above, not on Things on the Earth.* Concluding from thence, that *Christians* ought not to mind what's on the Altar at the Time of the Celebration of the Mass, but rather raise their Thoughts to Heaven by Faith, to find there the Son of God, who was to be met with no where else; which *Opinion*, he thought he could confirm, by these Words of the Priest, in the Preface, *Sursum Corda*, lift up your Hearts; and the People answering, *habemus ad Dominum*, we lift them up unto the Lord; and on that, thinking to have prov'd very well, that there was nothing upon the Altar after the Consecration worthy our Attention, he cried with all his Might, several Times, addressing his Discourse to the King, *Sursum Corda*, Sir, *sursum Corda*. 'Tis true, says *Maimbourg*, that the Curate preach'd then, clearly enough, the Dogma's of *Zuingle*; but as he forbore expressing himself in formal Terms, the King could not discover the Venom hidden under his pompous Expressions; Means were even found, that his Majesty, the better to be inform'd of the Truth, should hear him in his Closet, where the Curate said a great deal more to him than he had done in his Sermon; so that the King, who thought him a good *Catholick*, and a very learned Man, began to be uncertain of what he ought to believe. But the Cardinals *John of Lorrain*, Brother of *Claudius*, Duke of *Guise*, and *Francis of Tournon*, both very far in the King's Confidence; having discover'd the private Audiences the Curate had had of the King, found efficacious Means to ruin at once his Designs, and to confirm the King in the antient Belief of the Church; for they engag'd *Le Coq* to enter into a Conference with some of the most learned Doctors of *Paris*, who oblig'd him to confess that he had been deceiv'd, and to condemn publickly, in his Pulpit, the new Doctrine he had preach'd. Which had the Effect those two Cardinals expected, on the King's Mind.

But, however, this Disappointment of the Queen of *Navarre*, occasion'd by the publick Recantation of the Curate of St. *Eustache*, had no other Effect upon her, than to engage her to take other Measures to gain the King to the new Religion; she knew that his Majesty wish'd for nothing more passionately, than the Peace of the Church: Therefore she took him on that Side, and began by praising to him a very honest Man, said she, call'd *Philip Melancthon*, whom she represented to him as the most learned Man of his Time; who, tho' he condemn'd certain Abuses which had been introduc'd in the Doctrine, Manners, and Discipline among the *Christians* of the latter Centuries; detested, however, the Schism occasion'd thereby in *Germany*, which he had put all in Use to extinguish. She protested that he was a pacifick Man, of a sweet Temper, having nothing of the violent and impetuous Genius of *Luther* and *Zuingle*, whom he had always endeavour'd to reconcile, with themselves, and with the *Catholicks*, the better to restore Peace and Unity in the Church, which he desir'd passionately; that she made no Doubt but that if so learned, and so holy a Man, could enter into a Conference with the Doctors of *Sorbonne*, who thirsted, likewise, after Peace, they would find some Means to procure it to the Church, and to abolish a Schism which could extend itself from *Germany* into *France*, and cause in his Kingdom the same Troubles and Disorders which were seen in *Germany*.

This Discourse prov'd so persuasive, that the King was thereby prevail'd upon to write himself to *Melancthon*, to invite him to come to *Paris* to work in Concert with the *French* Theologians, to the Re-establishment of the antient Discipline in the Church. This Letter of *Francis* I. is found in *Florimond de Remond*, *l.* 7. *c.* 4.

This Step of the King caus'd an inexpressible Joy throughout the whole Party, who expected that *Melancthon*, by his Learning, his Dexterity, his insinuating Manners, and his Eloquence, could not miss gaining entirely the King to their Party. *Clement Marot*, who was then the Poet of the Court, wrote on that Subject some Verses, wherein, insulting to the *Sorbonne*, he says boldly, in his diverting, and easy Stile, that none of those *Messieurs nos Maitres* would dare to encounter with that Doctor, who knew a great deal more than they. But the Cardinal of *Tournon*, Archbishop of *Lyons*, who had already disconcerted their first Measures, frustrated again their Hopes in this second Occasion; for entering, one Morning, the King's Chamber, with a Book in his Hand, which he seem'd to read with great Attention; the King, surpriz'd at that Novelty, ask'd the Cardinal what *fine Book he was reading? It is, in Fact, Sir*, answer'd the Cardinal, *a very fine Book, since it is written by one of the first Apostles of* France, *the glorious Martyr St.* Irenæus, *who govern'd in the second Century my Church of* Lyons, *and whom several of the most antient, and most learned Fathers of the Church have respected as their Master. Therefore I was reading that fine Passage of his third Book, where he says, that he had learned from his Master, St.* Polycarp, *Disciple of St.* John *the Evangelist, that the holy Apostle being ready to enter the publick Baths, and hearing that the Heretick* Cerinthus *was there, retreated suddenly, saying, with some Emotion, to his Disciples,* Let's fly, my dear Children, and fly quickly, for Fear we should be destroy'd, with that Enemy of *Christ*; *so much were the Hereticks abhorr'd by the Apostles. This is what I was reading with Pleasure. But your Majesty will give me Leave to say, that it is with the greatest Sorrow that I hear that you, who, as the first-born of the Church, are its first Protector, have, nevertheless, call'd near your sacred Person the most famous of* Luther's *Disciples, that implacable Enemy of the* Catholick *Church, whose Doctrine and Conduct he condemns with so much Scandal, and with the Loss of so many Souls, which he has perverted.* And continuing his Discourse, he so well convinc'd the King, says *Maimbourg*, that his eternal Salvation, the Interest of his Kingdom, and his Reputation among foreign Princes, were at Stake, on that Occasion, that the King revok'd, at that very Instant, the Leave he had granted to *Philip Melancthon*; protesting then, with an Oath, that he would never deviate from the Belief of the antient Church; commanding, at the same Time, that the Hereticks, as they were call'd, should be prosecuted, and punish'd according to the Rigour of the *Ordinances*.

The Party was so irritated at this sudden, and unexpected Resolution of the King, that they abandon'd themselves to those Excesses which their most passionate Historians were forc'd to condemn; for not contented then, as they had been, with publishing some *French* and *Latin* Books, in Defence of their Doctrine, they had a prodigious Number of Libels, printed in *Switzerland*, full of Invectives and Menaces, against the King, which they had affix'd, not only in the publick Places, and at the Church-Doors, but likewise to the Gates of the *Louvre*, and even to the Door of the King's Chamber, in his Absence, while he was at *Blois*. That great Prince, being inform'd of these Disorders, return'd quickly to *Paris*, where he had the Authors, and Accomplices of that criminal and sacrilegious Attempt on the Royal Majesty, apprehended, and prosecuted; and having, a few Days after his Return, assembled the Clergy in the great Hall of the episcopal Palace, where, being gone himself, accompanied by his whole Court, and follow'd by the chief Magistrates, he made, from a Throne erected for that Purpose, so pathetick a Discourse, that it drew Tears from the Eyes of all the Assistants. He exhorted the whole Assembly to maintain always against the Hereticks,

ticks, (as he call'd them) the antient and true Religion of the moſt *Chriſtian* Kings, which Religion had ſupported for ſo many Centuries the *French* Monarchy, which could never be deſtroy'd but by Hereſy; proteſting, before God, that if he knew that one of his Arms ſhould be infected with that Plague, he would have it cut off; and that if one of his Children was ſo unfortunate as to fall into that Impiety, he would himſelf ſacrifice him to the divine Juſtice, and to his own.

This Diſcourſe, pronounc'd with an incredible Force, by a King who was naturally eloquent, was receiv'd with repeated Acclamations of the whole Aſſembly, who all proteſted that they would live and die in the *Catholick* Religion. From that Time, the King would never hear thoſe new Doctors mention'd; and the Queen of *Navarre*, his Siſter, who had ſo publickly declar'd herſelf their Protectreſs, reflecting ſeriouſly on the Exceſſes they had committed, which ſhe thought could not proceed from an apoſtolical Zeal, nor from a ſincere Deſire of a *Chriſtian* Reformation, which muſt be conducted with Meekneſs, Moderation, and Patience, died, 12 Years after, in the Boſom of the *Roman Catholick* Church, ſays *Florimon de Remond*, which, ſhe proteſted, ſhe had never pretended to renounce.

But if the new Doctors, who had all fled into *Switzerland*, loſt Ground in *France*, they made a new Acquiſition, ſoon after, which made them Amends in Part for that loſt, I mean of *Geneva*, one of the moſt antient, and moſt celebrated Cities of the *Gauls*, which was once imperial, but which acknowledg'd then their Biſhop as a Prince, who jointly with his Chapter, with the four Syndics, elected by the People, and the little and great Council of the two hundred, had the temporal Government of the City. There *William Farel*, the ſame we have ſeen ſo much in Favour, near *Briſſonet*, Biſhop of *Meaux*, was ſent by thoſe of the Canton of *Bern*, to preach the new Doctrine, which he did with ſuch Succeſs, that in a very ſhort Time he gain'd ſeveral of the chief Burgeſſes of the City, who, very well pleas'd with ſo favourable an Opportunity of recovering their antient Liberty, by ſhaking off, with the *Roman* Yoke, that of their Biſhop, enter'd into all the Meaſures concerted by the new Miniſters, for the Eſtabliſhment of their Doctrine; who began here, as they had done in all the Places where they had met with Encouragement, by plundering the Churches of all their Ornaments, deſtroying and breaking the Altars and Images, tho' for three or four Years, ſucceſſively, they met with a ſtrong Oppoſition from the Part of the *Catholicks*, in which they were ſupported by thoſe of the Canton of *Fribourg*, who were *Roman Catholicks*, and have remain'd ſo to this Day; while the other Party was countenanc'd by thoſe of the Canton of *Bern*, who were all *Zuinglians*.

Peter de le Baume, of the Houſe of *Maurevel*, in *Briſcia*, who was then Biſhop of *Geneva*, but abſent, ran to the Succour of his Flock, but too late. This Prelate was ſo indolent, that he us'd to take but very little Care of the Government of his Church, and of the City, but ſpent the greateſt Part of his Life in the Country, where he had vaſt Poſſeſſions. When he came to appeaſe the Troubles, they were already grown to ſuch a Height, and the City was in ſuch a Confuſion, that he ſoon found that he had loſt all his Authority among them; therefore he quitted *Geneva*, where the oppoſite Party, growing every Day more formidable, it was reſolv'd, at laſt, by the Council of the two Hundred, that the *Catholick* Religion ſhould be aboliſh'd in *Geneva*, as it had been at *Bern*; which was executed in the following Manner:

Father *James Bernard*, Guardian of the *Cordeliers*, or Grey Fryars, of the Convent of *Rive*, who had already preach'd the new Doctrine during *Lent*, had a Writing, (which he himſelf carried to the Chapter of St. *Peter*, and to the Monaſteries) affix'd to all the Corners of the Streets, and the Church-Doors, containing five Propoſitions, in Form of a Theſis, againſt the *Maſs*, the *real Preſence*, the *Worſhip of Images*, the *Invocation of Saints*, the *Purgatory*, and the *monaſtick Vows*; which were to be controverted in a Month's Time, under him, the Preſident, in his Convent. By the ſame Writings, all Sorts of Perſons were exhorted to be preſent at that Diſpute, with a Promiſe that every Body ſhould have the Liberty to ſay what he pleas'd. The Duke of *Savoy*, and the Biſhop of *Geneva*, ſtrictly forbad their Subjects to be preſent at thoſe Diſputes; which, notwithſtanding, were open'd the 30*th* of *May*, 1535, and ended the 24*th* of *June*. The Council, who aſſiſted there as Judges, had order'd four Secretaries to write all that could be ſaid on either Side, that the whole might be examin'd in a general Aſſembly of the *Syndics*, and of the two Hundred Burgeſſes of *Geneva*; and a Reſolution taken accordingly. This Diſpute was immediately follow'd by the Marriage of Father *Bernard*, who, to convince the World that he was perſuaded of the Truth of his Propoſitions, quitted his monachal Trouſers, and was married to a young Girl, Daughter of a Printer of *Geneva*; to whom, to ſecure her Dowry, he brought all he could carry off from his Convent.

But, however, the Magiſtracy of *Geneva*, to ſhew that they acted in that important Affair with a great deal of Deliberation, conſulted three Months longer, before they would conclude, by a publick Act, what they had already determin'd in particular. But, at laſt, after *William Farel*, who was then heard as an Oracle, had *had* a publick Audience in the great Council of the two Hundred, had diſclaim'd, with great Vehemency, againſt the *Maſs*, and the Practices of the *Roman* Church, which he accus'd of Superſtition and Idolatry; it was concluded, that what had been written on that Subject, on either Side, in the Diſputes of the Convent of *Rive*, ſhould be again examin'd for the laſt Time, in the ſame Council. This was done during two Days, after which, the *Syndics* having ſent for the *Auguſtines*, *Dominicans*, and *Cordeliers*, they were aſk'd if they had any Thing to object againſt the *five Propoſitions*; to which they anſwer'd, that they believ'd them heretical, and that they were determin'd never to call in Queſtion what had been ſo ſolemnly defin'd by the *Catholick* Church, and receiv'd, Time out of Mind, by their Anceſtors.

But, however, after the *great Council*, compos'd of a few Lawyers, Merchants, and Mechanicks, had given their Opinion on the five Propoſitions, and declar'd, of their ſupreme Authority, that they were orthodox, and the contrary Articles were nothing elſe but falſe and human Traditions againſt the Word of God; they iſſu'd out a Decree, in 1535, by which it was enjoin'd to all Citizens and Inhabitants of *Geneva*, to follow the new Religion, and the Exerciſe of the *Roman* entirely aboliſh'd. And to leave to Poſterity an eternal Monument of this great Event, (which *Maimbourg* calls a Revolt againſt the Church, and their Biſhop) they had plac'd the Year following, in their Town-Houſe, an Inſcription engraven in golden Letters, on a braſs Table, ſeen there ever ſince, and conceiv'd in theſe Terms: *In Memory of the Grace which God has done us, of ſhaking off the Yoke of the* Roman *Antichriſt, aboliſh'd his Superſtitions, and recover'd our Liberty, by the Defeat and Flight of our Enemies.*

Therefore, after the Publication of this Decree, the *Catholick* Clergy, Monks, and Nuns, were oblig'd to quit the City. Several Remonſtrances were made to the Nuns of St. *Claire*, who were the only ones in *Geneva*, to engage them to quit their Veils, and accept thoſe offer'd to them for Huſbands. The Miniſter *Farel* preach'd to them in their Convent, in Preſence of the *Syndics*, on this Text of the Goſpel, *Exurgens Maria abiit in Montana*, to prove to them, that, by the Example of the Virgin *Mary*, who went to viſit her Couſin *Elizabeth* on the Mountains of *Judea*, they ought not to be confin'd, and were obliged to live in the World, and marry, as well as others; but all, except one, call'd *Siſter Blaiſine*, perſiſted

ſiſted in the Reſolution of accompliſhing their Vows. Therefore the Magiſtrate, very well edified of their Piety and Virtue, had them conducted with Honour, and under a ſtrong *Eſcorte*, to protect them againſt all Inſults, as far as the Bridge of *Arve*, whence they retir'd to *Anecy*, where the Duke of *Savoy* had *had* a Monaſtery prepar'd for them.

This great Revolution invited all the *French*, who had the leaſt Inclination for a Change in Religion, to *Geneva*, and, in Conſequence thereof, a vaſt Number, who were afraid to appear publickly in *France*, reſorted thither, where they were kindly receiv'd, becauſe they ſerv'd to re-implace the *Roman Catholicks*, who had been expell'd.

It was in that ſame Year, 1536, that the famous *John Calvin*, (of whom I muſt ſpeak at preſent, ſince he father'd the Doctrine heretofore mention'd, and call'd ſince, from his Name, *Calviniſm*) was receiv'd in *Geneva*.

JOHN CAUVIN, or CALVIN, (ſays *Papyr. Maſſar. Spond. ad Ann.* 1535. *Le vaſſ. ann. de l'Egliſ. de Noyon.* and *Deſmay*, *Vie de Calvin.*) was born at *Noyon* the *17th* of *July*, 1509; his Father was *Gerard Cauvin*, a Cooper of *Pont-Leveſque*, near *Noyon*; and his Mother *Jeanne le Franc*, Daughter of a Vintner near *Cambray*, who came to live at *Noyon* with his Son-in-Law *Gerard*; who having got ſome Money in the Exciſe, became, at laſt, Attorney of the Fiſk of the County of *Noyon*, and Secretary of the Biſhoprick. As *John Calvin* appear'd to have a great deal of Wit, and much Inclination to Study, his Parents ſent him to *Paris*, recommending him to his Uncle, *Richard Cauvin*, a Lockſmith by Profeſſion. This good *Artizan*, who was a very honeſt Man, took great Care of his Nephew, who ſtudied the Grammar at the College of *La Marche*, and Philoſophy at that of *Montaigu*. He had been preſented, while yet but eleven Years of Age, to the Benefice of *our Lady De la Geſine*, in the Cathedral of *Noyon*; and at eighteen to the Rectory of *Marteville*, which he *permuted*, two Years after, with that of *Pont-Leveſque*, near *Noyon*; and, nevertheleſs, his Father would never ſuffer that he ſhould ſtudy Divinity, but ſent him to *Orleans*, to ſtudy the Law, under that famous Profeſſor *Peter de l'Etoille*; whence, without having taken any Degree, he went to *Bourges*, to hear that famous Lawyer *Andre Alciat*, who read, with an extraordinary Concourſe, in that Univerſity, then, the moſt flouriſhing of the whole Kingdom, for the Law.

Calvin had already taken, while yet at *Paris*, ſome Tincture of the new Doctrine, which had been inſpir'd to him by his Kinſman, and Friend, *Robert Olivetan*, the ſame who flying afterwards into *Switzerland*, was the firſt of all who tranſlated the Bible from the *Hebrew*, into *French*. But he acquir'd a greater Knowledge of it at *Bourges*, by his intimate Acquaintance with *Melchior Wolmar*, a *German*, whom the Queen of *Navarre*, to whom the King her Brother had given the Dutchy of *Berry*, and who ſpar'd nothing, ſays *Beza*, to fill that Univerſity with learned Men, had ſent for from *Germany*, to be *Greek* Profeſſor, which he underſtood perfectly well, a Language almoſt unknown in *France* before that Time.

Wolmar, who was a *Lutheran*, tho' he affected *Catholicity*, finding in *Calvin* a very great Diſpoſition to be one Day a good *Proteſtant*, and that he had, with a great deal of Wit and Memory, a marvellous Aſſiduity to Study, taught him all he had learn'd of the Dogma's of *Luther*, and of *Zuingle*. He perſuaded him to apply himſelf entirely to the Study of the *Greek* Tongue, and he took the Pains to be his Maſter, that henceforward he might be capable of reading the Scripture. *Calvin* follow'd his Friend's Advice, learning, likewiſe, the *Hebrew* and *Syriack*; ſo that he ſtudied, at the ſame Time, the Law, the Scripture, the *Greek*, *Hebrew*, and *Syriack* Languages; neglecting the Science which was moſt neceſſary for an Eccleſiaſtick, I mean Theology; hence that Difference between him and *Luther*, who was a Doctor in Divinity, and a very learned one, reading with great Applauſe in the Univerſity of *Wittemberg*, which was then very flouriſhing.

While *Calvin* was at *Bourges*, his Father died, which obliged him to return to *Noyon*, to collect the Succeſſion of his Father; where having ſettled all his Affairs, and ſold his two Benefices, ſays *Papyrus*, he came to *Paris*, where, being yet but twenty Years of Age, he publiſhed a beautiful Commentary on the two Books of *Seneca on Clemency*. Having by that Work acquired ſome Reputation in *Paris*, he began to dogmatiſe ſecretly, in private Houſes, and contracted a ſtrict Friendſhip with the Chiefs of thoſe whom he knew to be Partizans of the new Doctrine, though they all took Care to diſſemble, for Fear of the *Lieutenant Criminal*, *John Morin*, who purſued them *Vi & Armis*; *Calvin* eſcaping very narrowly falling into his Hand, which happened thus.

A Maſter of Arts, called *Nicholas Cop*, who was intimate with *Calvin*, having been made Rector of the Univerſity, could not help in a Sermon, which he preached at the *Mathurins* on *All Saints Day*, advancing certain Propoſitions, by which he was ſuſpected to be of the new Sect. As the Thing made much Noiſe, he was deferred to the Parliament, by two *Cordeliers*, who had aſſiſted at his Sermon. The *Rector* being called before that Auguſt Aſſembly, to account for that Action, he would go there, in Ceremony, attended by his Beadles, *&c.* but as he paſſed through a Street near the Palace, ſomebody was ſo kind to diſſuade him from proceeding further, and adviſed him to take Care of himſelf, leaſt he would be ſent to the *Conciergery*; he followed the Advice, went back, and throwing off his Gown and Cap, fled to *Baſil*, where his Father, *William Cop*, was born, a very learned Man, who having ſettled in *France*, was become the King's Phyſician. The Lieutenant *Morin*, who had already diſcovered the Intrigues of *Calvin*, and the ſecret Conferences he had had with *Cop*, his Confident; and that he went in the Night-Time dogmatiſing from Houſe to Houſe, went himſelf, accompanied with his Satellites, to the College of Cardinal *Le Moine*, where he knew *Calvin* lodged, to apprehend him; but *Calvin*, who had had timely Notice of it, had made his Eſcape, ſome ſay through the Window of his Chamber, with the Help of his Sheets, ſo that when the Lieutenant came into the Room, he found only the Neſt, but the Bird was fled.

Calvin, not finding himſelf ſecure in *Paris*, after having took a Tour into his own Country, went to *Angouleſme*, near a Prebend, called *Lewis Du Tillet*, whom *Calvin* inſtructed in his new Doctrine, and at whoſe Houſe at *Claix*, he compoſed the greateſt Part of his Inſtitution. *Du Tillet* went even into *Germany* along with him, to confer with the Lutheran Doctors. And it was there that *Eraſmus*, after he had heard *Calvin* ſpeak on thoſe Points of Religion, the moſt controverted, ſaid to *Martin Bucer*, who had introduced him, *That he ſaw in that young Man grow a dangerous Plague, which would, one Day, cauſe a great Deal of Diſorder in the Church.* From *Germany* *Calvin* went to *Poitier*, where he made a great Number of new Proſelytes, among Perſons of all Ranks and Conditions. From thence he went to viſit *Fabri*, and *Rouſel*, at *Nerac*, and thence to *Paris*, where he thought Lieut. *Morin* had forgot him, but finding himſelf miſtaken, he quitted *France* for ever, and fled to *Baſil*, where he finiſhed his Inſtitution in *French*, which he dedicated to King *Francis* I.

From *Baſil*, *Calvin* croſſed the *Alps*, and went to *Ferrara*, with a Deſign to gain to his Party the Dutcheſs *Renée*, of *France*, ſecond Daughter of *Lewis* XII. and of Queen *Anne*, of *Bretagne*. That Princeſs was promiſed firſt to *Charles* V. while he was but Archduke, and afterwards to the Electoral Prince of *Brandenbourg*; but *Francis*, her Brother-in-Law, for ſome certain Reaſon of State, had her married to *Hercules* II. Duke of *Ferrara*, in the Year 1528. This Dutcheſs had a great Deal of Wit and Learning, having rendered herſelf, by an aſſiduous

Application to Study, very learned, especially in Philosophy, in which she equalled the greatest Philosophers of her Time, having, besides, an inexhaustible Fund of Goodness, which made her compassionate all those she thought unjustly persecuted. This, says *Florimond de Remond*, *l.* 7. made *Calvin* hope that he could gain her, and engage her in his Sect, by making her renounce that of *Luther*, in which she was known to be engaged. The Dutchess, continues the same Author, received him perfectly well, and would even hear him preach in her Closet; but being informed, that he run the Risk of being arrested, and sent to the Inquisition, though he had took the Precaution to disguise both his Name and Habit, taking the Name of *Happeville*, and the Clerical Habit, he soon repassed the *Alps*, after he had succeeded in his Undertaking, and gained the Dutchess on his Side. The inveterate Hatred that Princess had conceived against the *Roman* Church ever since Pope *Julius* II. had employed all Sorts of Arms, Spiritual and Temporal, against the King her Father, contributed much to her changing her Religion; for she often used to say, that being a Woman uncapable by the salique Law to succeed to the Crown, she could not be revenged, otherwise, of the Pope. The frequent Conferences she had with *Calvin* (says *Brantosm*, in his Panegyrick of that Dutchess) and the Poetry of *Clement Marot*, she had made her Secretary, made her so good a *Calvinist*, that nothing afterwards could make her change, not even the repeated Intreaties, nor the Menaces of her Nephew *Henry* II. who engaged the Duke of *Ferrara*, her Husband, to deprive her of the Education of her Children, threatning her with a more severe Usage, if she continued in her Obstinacy, but all this availed nothing; for having retired into *France*, after the Death of the Duke, under the Reign of *Francis* II. in 1575, she persisted in her Opinion to her Death, which happened at *Montargis* fifteen Years after, where during the Civil Wars, says St. *Marthe. l.* 9. and *Brantosm.* she received all the *Calvinists* she could into her Castle, and even used to feed 300 of them every Day.

Moreover *Calvin*, having quitted *Ferrara*, to return to *Basil*, took *Geneva* in his Way, where *William Farel*, who knew the Reputation he had acquired among the *French* Protestants, persuaded him to settle in *Geneva*, to assist him in the Government of the Christian Society, he had established. They divided between them both, the Cares of their Ministry. *Farel* used to preach; and *Calvin*, who had no Talent to speak in Publick, took Care to teach the Theology in the Manner he understood a Science, he had never learned. But as they both undertook to change a great many Things, and they refused to conform to the Practice of *Bern*, which was to receive the Sacrament with unleavened Bread; those of *Bern*, prevailed so far with the *Syndics*, already dissatisfied with the Conduct of those two Ministers, that they were banished by an Arrest, as seditious and publick Disturbers. After which *Farel* retreated to *Neufchatel*, where he was received for Minister, and *Calvin* to *Strasbourg*, near *Martin Bucer*, who obtained of the Magistrates for him, the Right of Citizen, and Leave for Building a Temple, for the *French Refugees*, and to teach Theology.

There, says *Beza*, *Calvin* revised his Christian Institution, which he had often changed, published his Commentary on the Epistle to the *Romans*, and by the Advice of *Martin Bucer*, who was willing that the Ministers should practise, at his Example, what they preached against Celebacy; he married the Widow of an Anabaptist, whom he obliged to change her Sect, to profess his own. He went afterwards with *Bucer*, and the other Deputies of *Strasbourg*, to the Conference of *Wormes*, and afterwards to that of *Ratisbon*, where *Charles* V. had undertook a Reconciliation between the Catholicks and Lutherans. *Beza* says, That *Calvin* acquired in those Conferences, a great deal of Honour, and the Title of profound Theologian. The Catholick Authors pretend, on the contrary, that he must have rendered himself equally odious to the Catholick and Lutherans, by disclaiming, alone, against the real Presence, and that they would never have suffered him among them, if he had not took the Occasion of leaving the Conferences first. This is what himself wrote to *Farel* on that Subject. *Tametsi Neminem ex aliis intellexeram, libere, tamen, sine Timore Offensionis, illam localem Presentiam damnavi. Crede mihi, in ejusmodi Actionibus, opus est fortibus Animis. Calv. ad. Farel. Epist.* i.e. Though I had understood none of the others, however I have freely, and without Fear of offending any Body, condemned that local Presence. Believe me, on those Occasions, there needs a bold Genius.

In 1541 the Faction, contrary to those who had expelled *Calvin* from *Geneva*, becoming the most powerful, he was recalled thither by the Syndics and Council, who took the Resolution to terminate, at once, all the Differences which caused so much Trouble in their new Republick, to have henceforwards, their Church regulated on the Form which *Calvin* would be pleased to give it; which he complied with, by establishing there, without the least Disturbance, his Doctrine and Discipline, which were followed afterwards, by the *French* Protestants, called, since, *Calvinists*, of whom I must speak now, going, however, further back, to give my Reader a general Idea of *Calvinism*.

Ever since the Doctrine of those who first denied the real Presence, had been condemned by the *Roman* Church, and retracted by the Archdeacon *Berengarius*, who had been the first to maintain it in 1160; that Church, says *Genebrard*, enjoyed a profound Peace; 'till 80 Years afterwards it was disturbed a-new, says *Prateolus Castro*, *John Paul*, and *Perrin*, *Hist. des Vaud.* by another new Doctrine, which was properly the Origin of that of *Calvin*. A certain Citizen of *Lyons*, called *Peter Waldo*, or *Valdo*, who lived in the twelfth Century, a simple Man, without Learning, but very rich, being frighted at God's Judgments, for having seen one of his Friends, with whom he had supped, die suddenly at his Feet, after Supper, took the Resolution to follow a Manner of Life, as near that of the Apostles as he could. He had for that Purpose translated, into his own Tongue, Part of the Scripture, especially the *New Testament*, to the Reading of which he applied himself, with a great Assiduity, not at all doubting, but as he was entirely devoted to God, he had also received from him all the necessary Lights, to understand perfectly the Scripture. And as he could not find, in what he read, the Terms of *Mass*, of *Pope*, and of *Purgatory*, he concluded from thence, that all those Things were nothing else but *false Traditions* and *human Inventions*; and that the *Roman* Church, which approved those Things, was the *Babylon of the Apocalypse*, and the *Pope* the *Antichrist*. And then believing himself called to the Apostolate, by a secret Inspiration, he undertook to preach this Doctrine to the People; and as the Austerity, Simplicity and Regularity of his Life, had already gained him a very great Reputation in *Lyons*, especially among the Poor, by whom he was followed and worshipped, and to whom he distributed his whole Estate in Alms, which he gave regularly every Day, his Opinions were heard and received, especially by the common People, as so many Oracles. The Archbishop himself could never hinder him from preaching, which he continued to do 'till after he had been excommunicated by Pope *Alexander* III. when he was expelled from *Lyons*, by the Magistrates, with all his Disciples, who chose to banish themselves, rather than to forsake him. And from that Time they were called *Valdois*, or *Vaudois*, or Poor of *Lyons*. Afterwards they dispersed themselves throughout all *Europe*, to preach their Dogma's, and gained a vast Number of Proselytes; and since were called by the Names of the Places, where they were in greater Number; or by that of their most famous Preachers; and by Derision in *France*, *Albigeois*, *Picards*, and *Arnaldists*; in *Germany*, *Boemians*; in

in *England*, *Lollards*; in *Italy*, *Fraticelli*; in *Flanders*, *Turlupins*; and elſewhere, by other ridiculous Names, becauſe deſpis'd every where, ſay the *Roman Catholicks*, eſpecially in *France*, where they were almoſt entirely exterminated, a few excepted, who retir'd into ſome Valleys of the *Alps*, near *Dauphine*.

This Doctrine, thus weaken'd, and almoſt extinct, was reviv'd 200 Years afterwards by *Wickliff*, of one Part, and *John Hus*, and *Jerom de Prague*, on the other; who having pick'd what they lik'd beſt from it, added to it ſomething better digeſted, of their own; but in the following Century *Luther* appear'd, who being far more learned than all theſe, form'd the *Lutheraniſm*, in Part, of what he borrow'd from the one and the other, and in Part of what he invented himſelf, on the moſt theological Points; *viz.* concerning *original Sin*, *Grace*, *Juſtification*, and *the Sacraments*: In which he was follow'd, at firſt, by a great Part of *Germany*, and then deſerted by ſome, even by his principal Diſciples, *Carloſtad*, *Zuingle*, and *Œcolampadius*, who became *Sacramentairs*.

This is the Genealogy of *Calviniſm*, ſince the moſt Learned among them agree that *Calvin* choſe for Foundation of his Religion the Doctrine of the *Vaudois*; eſpecially when he ſays that there is nothing elſe in the *Lord's Supper* but Bread and Wine, without the real or local Preſence of the Body and Blood of *Jeſus Chriſt*; when he condemns the Veneration and Invocation of Saints; rejects a viſible Chief of the Church, Hierarchy, Biſhops, Prieſts, Maſſes, Feaſts, Images, the Croſs, Benedictions, and all the other Ceremonies which the *Catholick* Authors pretend to prove, were us'd by the antient Church, and that *Calviniſm* form'd on the Model of the *Vaudois*, is but a *Skelcton of Religion*, having neither Unction, nor Ornament, nor any Thing elſe which could inſpire Piety and Devotion, which penetrating thro' the Senſes, to the inmoſt Parts of the Soul, raiſes it by the *Things viſible*, to the Contemplation of an *inviſible God*; that *Luther*, more reaſonable in this than *Calvin*, has dexterouſly avoided that Extreme; and that *Calvin* is nothing elſe, with all his Wit, but the Diſciple of that ignorant and illiterate Citizen of *Lyons*, *Peter Valdo*. The *Calviniſts* ſay, in their Defence, that *Chriſt* came on purpoſe to aboliſh all Sorts of Ceremonies, and to eſtabliſh among us a Worſhip, ſimple, eaſy, and free from all that could hinder us from adoring him, in *Spirit* and *Truth*. That none of the Apoſtles had better Education than *Peter Valdo*. That before the coming of the *Holy Ghoſt* they were all as ignorant as he was; and that they ſaw no Reaſon why the divine Scrutator of all Hearts, knowing the Sincerity of his Intentions, had not favour'd him as much as he did the Apoſtles, tho' not perhaps with ſo much Pomp and Ceremony; ſince he ſays himſelf, that he has choſen *the Infirm of this World*, *to confound the ſtrongeſt*. That *Valdo*'s Conduct was, in all Things, agreeable to that of the Apoſtles, and to the true Principles of that Religion they were ſent to eſtabliſh upon Earth; which are, Charity, Humility, Simplicity, and Diſintereſtedneſs; from which his very Enemies cannot reproach him with having ever deviated: That for his Diſciples being deſpis'd throughout the whole *Chriſtian* World, they were not then worſe us'd than the primitive *Chriſtians*, call'd in Deriſion *Nazarenes*.

As for the other Articles of Religion, thoſe relating to the *Euchariſt* excepted, *Calvin* borrow'd almoſt all of them from *Luther*; as thoſe concerning Free-will, which he deſtroys; the Grace of God, which, in his Opinion, *has always its Effect on Man*, and conquers the Will *by an abſolute Neceſſity*; the Juſtification *by Faith alone*; the Juſtice of *Chriſt*, which is *imputed to us*; the good Works, *without any Merit before God*; the Sacraments, *which he reduces to two*, and which *he diveſts of the Power of conferring Grace*; the Faith, which, in his Sentiments, conſiſts *in a certain Certitude that we ſhall be ſaved*; *the Impoſſibility of God's Commandments*; the *Inutility* and *Nullity of Vows*, thoſe of Baptiſm excepted; and ſeveral other ſuch Things, which he extracted from the Books of *Luther*, to make Part of his Inſtitution; tho' he added to it ſeveral Articles of his own Invention, *viz.* that *Faith is always attended with Doubts and Incredulity*, Inſtit. l. 3. c. 2. that *Faith and Grace can never be loſt*, Harm. in Mat. xiii. 20. that *the eternal Father does not beget continually his Son*, Inſtit. l. 3. c. 2. paragr. 9, 11, 12. that *the Son has not his Eſſence from the Father, nor the Holy Ghoſt from the Father and Son*, Inſtit. l. 3. c. 13. that *Chriſt has merited nothing with regard to the Judgment of God, and was afraid of not being ſaved*, Inſtit. l. 2. c. 17. l. 3. c. 16. Luc. 3. c. 22, 23. that God has created *the greateſt Part of Mankind to damn them, not becauſe they have deſerv'd it for their Crimes, but becauſe it is his Will to do it*, having foreſeen their *Damnation*; but in Conſequence of his having decreed it, before he foreſaw their Crimes, which deſtroys entirely, ſay the *Catholick* Authors, the juſt Idea we ought to have of God, and leads us to *Atheiſm*.

As concerning the *Euchariſt*, every Body knows that *Calvin* differs widely from *Luther*, who has always maintain'd, that according to theſe Words of *Jeſus Chriſt*, *accipite & manducate*, *hoc eſt corpus meum quod pro vobis tradetur*, that Body is really preſent in the Sacrament, againſt all the *Sacramentairs*, who will have him there *only in Figure*; which Opinion *Calvin* borrow'd from *Zuingle* and *Œcolampadius*, tho', at the ſame Time, he pretends to ſay a quite different Thing; for after he has often repeated, that *that* Sacrament is *not a ſimple Figure, without Effect*; *and that it is not only by Thought, and Imagination, or by a lively Repreſentation of the Death of Jeſus Chriſt, we receive his Body, but that it is by the ſpiritual Mouth of the Faith, which has the Virtue to give us really that ſacred Body, and to apply him to our Souls for their Nouriſhment*, Inſt. l. 4. c. 9. Whence, ſay the *Roman Catholicks*, it appears, that he ſays nothing by theſe new Expreſſions, but what the *Sacramentairs* had ſaid purely and ſimply, and that he throws himſelf into an Embarraſs, whence 'tis impoſſible he ſhould extricate himſelf. For, continue they, ſince he maintains always, that *Chriſt* is no where elſe but in Heaven; hence it manifeſtly follows, that *Faith*, let it be ever ſo efficacious, cannot place the Body of *Chriſt* really in thoſe who receive the Sacrament, and that it makes them only believe they receive it in Memory of the Paſſion of our Saviour, who died for us, and that he vivifies and nouriſhes ſpiritually our Souls by his Grace, and his Spirit; which is ſo clear, and ſo true, that in the very Place where *Calvin* ſays, with ſo many pompous Expreſſions, that *Chriſt gives himſelf to us, by Faith, but really in the Sacrament*; he is forc'd to confeſs, in formal Terms, that it is by communicating to us his Spirit and Life, tho' his Fleſh does not enter within us; *Proprium in nos vitam diffundere, quamvis in nos non ingrediatur Caro Chriſti*, Inſtit. l. 4. c. 9. § 32. Therefore, conclude they, *Calvin*, who is ſo often repreſented by his Partiſans as an extraordinary Man for Wit and Learning, is but an able Copiſt, who has pyrated all what the other Hereticks had ſaid before him; and that his Inſtitution, eſteem'd by them a great Work, is moſt properly but a Collection of what he has choſe out of the Writings of *Luther*, *Melancthon*, *Zuingle*, and *Œcolampadius*. They confeſs, however, that if he had not ſo great a Capacity as *Luther*, he is far more polite, and gives to his *Latin* Writings a far more delicate and fine Turn, which are full of Wit and Vivacity; tho' he is as fiery as *Luther* when he is angry. This is the Syſtem of *Calviniſm* for the *Dogma's*.

As for the Diſcipline, he regulated his Authority very nearly in the ſame Manner 'tis ſeen at preſent among his Diſciples, by eſtabliſhing Conſiſtories, Synods, Elders, Deacons, the Form of Prayers and Sermons, and the Manner of celebrating the Lord's Supper, of adminiſtring Baptiſm, and of burying the Dead.

In

In this Manner, say again the *Roman Catholicks*, *Calvin* made himself *Pope* of *Geneva*, while he was endeavouring to destroy the Authority of the *Pope* of *Rome*, and finding Fault with a Power which he usurp'd himself; since by his Industry, Dexterity, and continual Application to the Functions of his Office, and other Affairs, he acquir'd soon so great a Reputation, and so much Credit and Authority, not only in the Consistory, but likewise in the Council, that nothing was transacted there without his Advice. What contributed to render him still more powerful, was, the great Concourse of Foreigners, especially *French*, who flock'd to *Geneva*, among whom was a great Number of very learned Men, most Fryars and Monks, who had deserted their Monastery under the specious Pretence of Religion, tho', in Reality, for *a Petticoat*. They all profess'd a great *Attachment* for *Calvin*, as their *Protector*, who, in Gratitude, us'd to take Care of their *Establishment*, and that no Injustice should be done to them. For having discover'd that one of the most Apparents of *Geneva*, call'd *Amy Perrin*, who had been formerly Captain-General, had conspir'd against the *French*, so far as to be suspected of having undertook to have them all massacred, *Calvin* had him condemn'd to Death. This noble Action render'd him still more absolute, and more dreaded at *Geneva*, whence he extended his Care as far as *France*, sending thither some *Ministers* he had form'd himself, to establish and regulate, according to his Discipline, the new *Calvinist* Churches they had establish'd in several of the best Cities and Towns of that Kingdom.

But, however, they were oblig'd, by the Severity of the *Arrests*, issu'd continually against them, to preach and pray secretly, till after the Fight of St. *Quintin*, in 1557, where *Henry* II, King of *France*, having been worsted, they thought he had something else to mind, than the Affairs of Religion, and therefore assembled publickly at Noon-Day, in the most frequented Streets of *Paris*, and in a Place call'd *Le Pre-aux-Clercs*, to sign the Psalms of *Clement Marot*, whom I have already mention'd, who was very famous among them.

This *Marot*, says *Florimond de Remond*, *l.* 8. *c.* 16. was born at *Cahors*, and in some measure a Poet, the best, and most polite of his Time, where Politeness was not much in Vogue. With this Talent, he ingratiated himself with *Francis* I, to whom he was made *Valet de Chambre*; but as he was one of the first who embrac'd the new Doctrine, and he saw that the King his Master spar'd no Body on that Subject, afraid of being arrested, he fled into *Bern*, and from thence to *Ferrara*, near the Dutchess *Renee*. Some Time afterwards that Princess, at his Intreaties, manag'd his Peace, and obtain'd his Return from the King. He then came back to Court, where, to disengage the Word of the Dutchess, he follow'd the Advice of *Vatable*, *Regius Professor* of the *Hebrew* Tongue, who persuaded him to employ his Wit, and the Talent he had for Poetry, to translate the Psalms, which he offer'd to interpret to him, from the *Hebrew* into *French*. *Marot* translated, at *Paris*, in 1558, his first thirty Psalms, which, speaking without Prejudice, or Partiality, are very ill done, and not at all conformable to the original *Hebrew*. They were no sooner publish'd, but the Faculty of Theology represented to the King, that nothing was more dangerous than that *Burlesque*, and inaccurate Translation; which Remonstrance oblig'd *Marot* to quit once more *Paris*, and to fly to *Geneva*, near his old Friend *Calvin*, who made him translate twenty other Psalms, which he did in the same Manner he had done the first thirty at *Paris*.

This, however, prov'd of no Service to him; for tho' he had often read, and meditated the Psalms, we learn from the Ecclesiastical History of the Reform'd Churches, *l.* 1. from *Cayer's Formula*, and from *Florim. de Rem. l.* 8. *c.* 18. that following his former licentious Life, and having debauch'd the Wife of his Landlord, which at *Geneva* was a Crime punishable with Death, *Calvin*, by his Credit, had that Punishment chang'd into a whipping Bout thro' the Streets of *Geneva*; after which, *Marot* went to hide himself beyond the *Alps*, in *Piedmont*, where he died, aged 60 Years, and a good *Calvinist*.

These were the Psalms, sung, then, by the *Calvinists*; to which *Beza* added the rest of the *Psalters*, and which were set to Musick by the best Masters of those Times, says *Godeau*, Bishop of *Vance*; and by very bad ones, says *Maimbourg*.

The *Calvinism*, who had been confin'd, at first, in *Paris*, to the common People, began soon to make considerable Progress among the Quality; and even Persons of the first Rank, who would not appear publickly *Calvinists*, for Fear of disobliging the King; a few excepted, who declar'd publickly their new Belief. The most considerable among those who declar'd themselves publickly, was the Lord *Dandelot*, Brother of the *Admiral de Coligny*, and Colonel of the *French* Infantry; a Hero who had shew'd his extraordinary Valour and Courage, and had render'd signal Services on all the Occasions he had been engag'd in. *La Popliniere*, *l.* 5. *Thuanus*, *Dupleix*, and *Mezeray*, say, that the Cardinal *De Granvell*, in a Conference he had with the Cardinal *De Loraine*, for a Project of Peace between the two Crowns, said to him, among other Things, to convince him of the Necessity of that Peace, that the *Calvinism*, which began to insinuate itself into *Flanders*, was not only among the Populace in *France*, as before; but that it begun, likewise, to be introduc'd among the Nobility: And for Proof of it, he produc'd a Letter of *D'Andelot's*, to his Brother the Admiral, Prisoner in the Low Countries ever since the Fight of St. *Quintin*; with which he had sent him some Books printed at *Geneva*, to chear him up during his Imprisonment. The Cardinal *De Loraine*, who hated the *Coligni's*, *Calvinists* or not, inform'd the King of it, who heard, besides, at the same Time, that *D'Andelot*, in his Journey to *Britanny*, where he had been, to see the Estate of his Wife, had *Calvinism* preach'd in his House, where every Body was admitted, without Distinction.

The King, who lov'd *D'Andelot*, whom he had brought up, order'd the Cardinal *De Chatillon*, his Brother, and his Cousin the Lord *Francis* of *Montmorency*, the Admiral's eldest Son, to engage him, when his Majesty should examine him concerning his Belief, to speak well of the Mass; for the two Words which distinguish'd the *Catholicks* from the *Calvinists*, was *Mass*, on one Side; and *Presche*, or *Sermon*, on the other: But all they could do could never prevail upon him to have, at least, that Complaisance for his Master; so that when the King, who was then at *Monreaux*, where he had him sent for, ask'd him, after he had first spoke to him as the most tender Friend, what he believ'd of the *Mass*; he answer'd haughtily, that he thought it *an abominable Invention of Men*. So disagreeable and unexpected an Answer, surpriz'd and embarrass'd the King so much, that tho' he was not naturally passionate, he had *D'Andelot* turn'd out, protesting, at the same Time, that if he had not the Honour of being his *Eleve*, he would run him thro' with his Sword; and then sent him Prisoner to the Palace of the Bishop of *Meaux*; from whence he was remov'd to the Castle of *Melun*, and some Time after set at Liberty, upon his having consented (press'd by the important Sollicitations of his Friends, and mov'd by the Tears of his Wife) that *Mass* should be said before him.

Very near the same Time, the *Calvinists* gain'd to their Party *James Paul Spifame*, a Man of Quality, of a great deal of Wit, Learning, and Experience, and very dextrous in the Management of the most intricate Affairs; who had been Chancellor to the Queen, Counsellor and President to the *Anquests*, Master of the *Requests*, and at last Bishop of *Nevers*. We find, in *Gallia Christiana*, that *Spifame* chang'd his Religion to marry a beautiful *Calvinist* Lady, with whom he was passionately in Love: So that being deserr'd to Justice, and afraid of being arrested, he fled, says

La Popliniere, l. 5. to *Geneva*, where *Calvin*, and the *Seignory*, who thought to have made a great Conqueſt over the *Catholicks* by the Deſertion of a Perſon of that Conſequence, received him with open Arms, made him a Citizen of *Geneva*, and gave him an honourable Poſt in the Council of the two hundred. And as the Civil War began ſome Time after in *France*, *Calvin*, ſays *Sponde Hiſt. Genev. l.* 3. having made him, of a Biſhop, a Miniſter, ſent him to *Orleans*, near the Prince of *Condé*, who, knowing his Capacity, employed him in ſomething elſe, beſides preaching. For he ſent him to the Diet of *Francfort*, to juſtify the Arms which the *Calviniſts* had taken againſt their Sovereign, and to aſk the Emperor *Ferdinand*, and the other Princes of the Empire for Succours, which he could not obtain. After this fruitleſs Expedition, *Spifame*, being returned to *Geneva*, he was ſuſpected to have endeavoured to betray the Party, ſays *Sponde*, *l.* 3. and to have negotiated, under Hand, his Peace with the Catholick Church. Therefore as it was determined, that he ſhould be made away with, he was accuſed, either juſtly or falſly, of having made a falſe Contract, and falſe Seals, on which he was tried and condemned to be beheaded, which Sentence was executed upon him, on the Scaffold, ſays a *Calviniſt* Writer; he appeared very penitent, and made a very fine and moving Speech to the People. The *Roman Catholick* Authors, who have mentioned this unhappy Cataſtrophe, imagine, that he repented then of having deſerted, with ſo much Scandal, the Catholick Religion; and that he made a publick Abjuration at his Death. This happened in 1559.

In the ſame Year, the Peace being concluded at *Cateau, Cambreſis*, the King, conſidering that *Calviniſm* had conſiderably gained Ground in his Kingdom, during the laſt War, and being informed that the Edicts he had made againſt it were ſo far neglected, that even ſome Members of the Parliament of *Paris* had turned *Calviniſts*, as it had appeared in the Mercurial after *Eaſter*, he formed the Reſolution, ſays *La Popliniere, l.* 5. *Mezeray*, and *Dupleix*, to be in Perſon, at that which was to be held the 10th of *June*, in the Convent of the *Auguſtins*, where he went, accompanied by the Princes, Cardinals, Conſtable, Keeper of the Seals, and other Grandees of the Kingdom. After he had declared in few Words his Deſign of reſtoring the Peace to the Church, as he had done to his Kingdom, the Cardinal of *Sens*, *Bertrandi*, Keeper of the Seal, informed the Company by his Orders, that he would have the Deliberation, began by the Article of the *Mercurial* on the Fact of Religion, continued; and that every Body, in Order, ſhould give freely his Opinion in his Preſence; which was done accordingly, and the greateſt Part agreed among themſelves, by being of Opinion that the King ſhould procure, as ſoon as poſſible, the Convocation of a general Council, to appeaſe the Troubles wherewith the Church was agitated. Nothing, ſay the Catholick Authors, appeared more juſt and reaſonable than this Advice, which was but a Repetition of the ſecond Article of Peace, by which the two Kings of *France* and *Spain* obliged themſelves to unite together, for the Convocation of a Council, which ſhould terminate the Differences in religious Matters. But there was afterwards a great Variety of Opinions; for the one were for proceeding in the Interval, according to the King's Intention, and in all the Rigour of the Edicts and Ordinances againſt all thoſe, who ſhould continue to maintain a Doctrine contrary to that of the Catholick Church. The Principal among theſe, were the firſt Preſident, *Gilles Le Maiſtre*, and the Preſidents *De Harlay*, *Seguier*, *St. André*, and *Mynard*, one of the moſt inveterate againſt the *Calviniſts*, and who mortally hated them. The others maintained, on the contrary, that the Pains, inflicted by the Edicts, which were too rigorous, ſhould be mitigated; and ſome were of Opinion, that 'till the Opening of a future free Council, not only the Execution of the Edicts againſt thoſe called *Hereticks* ſhould be ſuſpended; but they could not, likewiſe, help ſhewing that they were *Calviniſts* themſelves. Theſe were the Preſident *Du Ferrier*, and the Counſellors *Anthony Fumee*, *Nicole Du Val*, *Claudius Viole*, *Euſtachius de la Porte*, *Lewis du Faur*, and *Anne du Bourg*, who declared himſelf more openly than all the Reſt, and ſpoke more like a Miniſter, inveterate againſt the *Maſs*, and the Pope, than like a Counſellor.

The King, full of Indignation, againſt theſe laſt, after he had ſaid that knowing the Diſpoſition of the Minds in his Parliament, he would likewiſe know very well how to reward the good, and puniſh the bad ones, had, immediately, the Counſellors *Du Faur*, and *Du Bourg* ſeiſed and carried to the *Baſtile*; and, ſoon afterwards, ordered that the ſix others ſhould be treated in the ſame Manner; but none but three could be arreſted, who were taken in their Houſes, *viz. Fumee*, *De la Porte*, and *Du Faur*, the three others being fled.

The Parliament ſoon after made the neceſſary Preparations for the Trial of thoſe Priſoners, but before it could be ended, the King amidſt the Publick Rejoicings, made for the Marriages of his Daughter and Siſter, received the 29th of *June* 1559, in a Turnament, that fatal Blow, of a Splinter of a Lance, which *Montgomery* gave him, ſome ſay with, and ſome without a premeditated Deſign, into the Right Eye, and of which he died the 10th of *July*, in the 12th Year of his Reign, and the 42d of his Age; a Prince of an excellent Temper, extraordinary Bounty, Clemency, affable, liberal, juſt, and paſſionate for the true Glory, encouraging and cheriſhing Men of Letters, and of an extraordinary Merit, brave, very dexterous in all Sorts of honeſt Exerciſes, happy in War, covered with Glory, for his noble Actions, and the Conqueſts he had made, as well by himſelf, as by his Lieutenants, in *Flanders*, *Luxembourg*, *Lorain*, *Germany*, *Piedmont*, *Tuſcany*, in the Iſland of *Corſica*, and triumphed over all the confederated Forces, of *England*, *Spain*, the *Low-Countries*, and the Empire, all united againſt him, having himſelf alone, and with main Force, before *Mentz*, and at the Battle of *Renty*, ſtopp'd the impetuous Courſe of *Charles the* 5*th*'s Fortune.

The *Calviniſts* thought, that after the King's Death, the Government would be ſo weak under a young King of 15 Years old, that he would be afraid to purſue them, and to irritate a Party, rendered ſo powerful by the Multitude, and ſo formidable by the Quality of thoſe who had entered into it, and who were known capable, ſays the Catholick Authors, to undertake any Thing. They were then ſo little afraid of the ſuperior Powers, that the Queen Mother, *Catharine*, found on her Toilett ſome Letters; and Writings were publiſhed, by which they threatened her openly to ruin her, if ſhe refuſed to ſet the Priſoners at Liberty. The ſame Authors pretend, that ſhe was even informed of a Conſpiracy formed by the *Calviniſts*, to free them by Force, by ſetting Fire to ſeveral Quarters of *Paris*. But as thoſe who were at the Helm, were not to be intimidated by thoſe Menaces, and had took Care to provide for the publick Security, the Trial, begun againſt thoſe Priſoners in the *Baſtile*, was purſued with Vigour. It happened that the Twelfth of *December*, *Anthony Mynard*, *Preſident au Mertier*, born at *Gannat* in *Bourbonnois*, a Man of a rare Merit, and declared Enemy of the *Calviniſts*, as he was returning from the Palace on his Mule, was ſhot by Aſſaſſins, near his Houſe in the old Street of the *Temple*. Captain *Stuart*, who pretended to be Kin to the then reigning Queen, the unhappy *Mary Stuart*, was ſuſpected of that Murder, which he always denied with great Conſtancy and Reſolution, even amidſt the excruciating Torments of the ordinary, and extraordinary Torture.

This Murder, far from intimidating thoſe at the Helm, made them reſolve to have the Sentence executed, pronounced againſt *Anne du Bourg*, who was hanged, and burnt in the Place of *Greve*, the 23d of *December*, 1559.

However, *Calviniſm*, under the Reigns of *Francis* I. and *Henry* II. was but yet, as it were, in its Infancy, without a Head, Conduct, Forces, or Arms, to oppoſe the Powers who had reſolved to ſuppreſs it: But it being paſſed from one Extremity to the other, under that of *Francis* II. it became ſoon a great and formidable Party, formed of the Diviſion and Quarrels of two others, who declared ſoon, openly, againſt each other.

There were then in *France* two very illuſtrious Houſes, who, after the Princes of the Blood, obtained the firſt Rank, and excelled all others for Nobility, Favour, Credit, Power, Honour, and Authority; *viz.* the Houſe of *Guiſe*, and that of *Montmorency*. The Chief of this was the famous *Anne* of *Montmorency*, Conſtable of *France*, and Grand-Maſter of the King's Houſhold, a Perſon of a conſummate Wiſdom, and Experience in War, as well as in the Cabinet, and who to the Glory of his Anceſtors, honoured Time out of Mind, with the glorious Title of *Firſt Chriſtian*, and *Firſt Chriſtian Baron of France*, &c. joined, That he had acquired in the Service of the Kings his Maſters, who had always diſtinguiſhed him by ſome particular Marks of their Favour and Confidence; and what rendered him ſtill more conſiderable is, That his great Merit which had gained him the Reſpect and Veneration of the whole Court, at his Age of very near 72 Years, was ſupported by the rare Qualities of his five Sons, all very brave Men, and of the three Brothers *Colignis* his Nephews, Sons of his Siſter *Louiſa* of *Montmorency*, *viz Odet*, Cardinal of *Chatillon*, *Gaſpar De Coligny*, Admiral of *France*, and *Francis D'Andelot*, Colonel of the *French* Infantry, all three perfectly united and eſteemed, eſpecially among the Nobility and Soldiers, as brave, couragious and intrepid.

The Houſe of *Guiſe* was eſtabliſhed in *France* by *Claudius* of *Lorain*, a younger Son of Duke *René*, and Brother of Duke *Anthony*, who having received for his Appennage the large Poſſeſſions the Duke had in *France*, eſpecially the Earldom of *Guiſe*, erected ſince into a Dutchy, he came into the Kingdom under *Lewis* XII. and deſerved by his ſignal Services, much more than by his Birth, to marry *Antonia* of *Bourbon*, Daughter of *Francis*, Earl of *Vendoſme*, and Aunt to *Anthony* King of *Navarre*, and to *Lewis*, Prince of *Condé*. This Princeſs proved the ſtrongeſt Support of his Houſe, by preſenting him with ſix brave Princes, beſides four Princeſſes, the eldeſt of whom, *Mary* of *Lorain*, had the Honour to marry *James* V. King of *Scotland*, of whom ſhe had *Mary Stuart*, afterwards Queen of *France*. But as the Duke and the Conſtable divided between them the Favour of *Henry* II, and that Rivals in Favour and Ambition cannot be without ſome Jealouſy, 'twas that, without Doubt, which began to breed the Diviſion between thoſe two Houſes, and which increaſed a great Deal more, after *Claudius*'s Death, by the great Progreſſes the famous *Francis*, Duke of *Guiſe*, his eldeſt Brother, made in the Affection and Confidence of the King his Maſter, who loved him as if he had been his Brother. The Glory which this new Duke acquired at the Siege of *Metz*, which he defended againſt the formidable Army of *Charles* V. his taking *Calais* and *Thionville*, &c. contributed much towards riſing ſtill higher in Credit, Favour, and Reputation; while, on the contrary, the Misfortune, which happened to the Conſtable, by the Loſs of the Battle of St. *Laurent*, where he was made Priſoner, and by the taking of *St. Quintin*, where the Admiral was alſo taken, brought the *Montmorency*'s into Diſgrace. But what raiſed the Houſe of *Guiſe* to the higheſt Degree of Elevation and Grandeur, they could aſpire to, was the Marriage of the *Dauphin* with *Mary Stuart*, Queen of *Scotland*, and their Niece, ſince at King *Henry*'s Death, they found themſelves Uncles of the new King *Francis* II.

In Faſt, the Queen-Mother *Catherine* of *Medicis*, having a great deal more the Princes of the Blood than thoſe of *Guiſe*, whom ſhe imagined would be always dependant of her, took the Pretext of that Alliance, to have them intruſted with the Government, which the young King, who was yet but 15 Years old, divided between the Duke of *Guiſe*, and the Cardinal of *Lorain*, his Brother; he gave to the firſt the Superintendancy of the Armies, and to the ſecond, that of the Finances, and to both, the Direction of the Political Affairs, under the general Superintendancy of the Queen-Mother, which Diſpoſition he declared publickly to have done, at the Example of the Kings his Predeceſſors, who had always conſidered as a *Right inſeparable from the Crown, to chooſe whom they pleaſed for their Miniſters.* The Princes of the Blood, who appeared diſſatisfied at it, were diſmiſſed, under ſome ſpecious Pretexts. The Conſtable, who had no longer the Command of the Army, retired to his Houſe; his Poſt of Grand-Maſter, which he was obliged to reſign, was given to the Duke of *Guiſe*, preferable to *Francis* of *Montmorency*, who was made Marſhal of *France*.

There were among the Malecontents, two great Princes, *Anthony* of *Bourbon*, King of *Navarre*, and *Lewis*, Prince of *Condé*, his Brother, who rendered formidable the Party which had been formed againſt the *Guiſes*. *Anthony*, Son of *Charles*, Duke of *Vendoſme*, and of *Frances* of *Allençon*, he, who after the Princes of *Valois*, was nearer to the Crown, had naturally ſeveral excellent Qualities, for he was good, generous, affable, civil, of a good Senſe, agreeable, pleaſant in Converſation, brave in Battle, and a very great Maſter in the Military Art; but he was not a great Man in the Cabinet, in which he was always diſappointed, therefore he uſed to fear it more, than the moſt formidable Army. But what proved more prejudicial to him was, that beſides his voluptuous Life, he was very indolent, irreſolute, and inconſtant; and that he was eaſily led by the Noſe from one Extremity to another; whereby he found himſelf, ſay the Catholick Authors, one of the firſt of that Party engaged in *Calviniſm*; for a Monk, called *Peter David*, who had deſerted his Monaſtery, and retired to *Nerac*, after he had been expelled from *Agen*, where he wanted to eſtabliſh *Calviniſm*, having found the Secret to enter deeply into the Confidence of this eaſy Prince, he choſe him for his Preacher, or rather Miniſter, and embraced his Doctrine. He even, ſome Time afterwards, ſays *Brantoſme*, in his Panegyrick of the King of *Navarre*, brought him to Court, where King *Henry*, who found it very ill, reprimanded him for it, ſo that for Fear of irritating the King, *Anthony*, though a good *Calviniſt*, uſed to go to Maſs. The Queen *Jane* of *Albret*, his Wife, was not well pleaſed, at firſt, with this Change of Religion, leſt it ſhould have obſtructed the Deſign they had formed, for the Recovery of the Kingdom of *Navarre*, either by open Force, or by Negotiation; but the Hatred hereditary in her Houſe, for the Popes and the Court of *Rome*, who had been the Cauſe of the Diſgrace of her Houſe, conquered all other Conſideration, and engaged her to follow the Example of her Huſband, which ſhe did ſo effectually, that ſhe refuſed always afterwards to imitate him in his Recantation.

Mr. *Le Laboureur*, on the Memoirs of *Caſtelnau*, and the Eccleſiaſtical Hiſtory of the reformed Churches ſay, that the Prince *De Condé*, who had all the good Qualities of his Brother, with a Vivacity and Strength of Imagination, accompanied with Reſolution and a Greatneſs of Soul, worthy his high Birth, and Quality of firſt Prince of the Blood, had embraced the new Opinions in Complaiſance for the Lady of *Roye*, Siſter of the Admiral, his Mother-in-Law, and for *Eleonora*, of *Roye*, his Wife, both of a ſuperior Genius and Virtue, and both the moſt zealous *Calviniſts* of their Time. As for the *Colignis*, 'tis certain, ſays *Brantoſme*, that *D'Andelot* had took the firſt Tincture of that Doctrine, in reading certain *Lutheran* Books, ſent to him to the Caſtle of *Milan*, where he was Priſoner, after having been taken by a Party of *Spaniards*, and that at his Return into *France*, he inſtructed his two Brothers in the ſame Principles. There is even ſome Appearance, that *Louiſa* of *Montmorency*, their Mother,

Mother having been of the Number of thoſe Ladies who under *Francis* I. favour'd the new Doctrine, which ſhe follow'd to her Death, inſpir'd her Children with an Inclination for it. The Truth is, that the Admiral was already a very good *Calviniſt* when he ſent the *Chevalier de Ville-gagnon* into *America* to prepare there a Sanctuary for all thoſe of his Sect.

Theſe illuſtrious Perſonages, thus diſpos'd, ſeeing the *Guiſes*, their Enemies, at the Head of the *Catholicks*, put themſelves, likewiſe, at the Head of the *Calviniſts*, who under ſuch Chiefs acted not only againſt the *Guiſes*, but againſt the Religion of the Kingdom, and againſt the Kings of *France* themſelves; which, according to the Eccleſiaſtical Hiſtory of the Reform'd Churches, *La Popliniere*, *Caſtelneau*, *l.* 1. *Mem. Belleforeſt*, *Belcaras*, *Aubigne*, *Thuanus*, *Dupleix*, and *Mezeray*, was concerted in the following Manner.

The principal *Calviniſt* Miniſters had already determin'd among themſelves, that to obtain Liberty of Religion, it was abſolutely neceſſary to take off the *Guiſes*, under Pretence that they had uſurp'd the Government to the Prejudice of the Princes of the Blood, to whom it belong'd by Right, eſpecially while the King, *Francis* II, was ſo young. This they publiſh'd in their Libels, which were very pertinently and learnedly refuted by *du Tillet*, in an hundred Examples extracted from the *French* Hiſtory. But to execute this bold, and very difficult Enterprize, they wanted a Chief; and as they ſaw that they could not depend on the King of *Navarre*, who would never be perſuaded to undertake any Thing for Fear of bringing upon him, as threaten'd already, all the Forces of the King of *Spain*, they apply'd to the Prince of *Condé*, who had more Reſolution, but a great deal leſs Prudence than his Brother, not at all doubting but that his Spite, Hatred, Ambition, and his bold Temper and Intrepidity, and the preſſing Intreaties of his Mother-in-Law, and of the Princeſs his Wife, both entirely devoted to the Party, would eaſily perſuade him to grant their Requeſt.

For that Effect, there was a very ſecret Aſſembly at the *Ferté*, under *Jouare*, where, with the Prince's Council, met the *Envoys* of his principal Confidents, and the *Miniſters* and Deputies of almoſt all the *Calviniſt* Churches; there it was concluded, on the Deciſion of the *Lutheran* and *Calviniſt* Miniſters, Profeſſors, and Counſellors, of *Germany*, *France*, and *Geneva*, that in the preſent State of Affairs it was juſt and right to take Arms; to ſeize, in what Manner ſoever, the Duke of *Guiſe*, and the Cardinal of *Lorrain*, his Brother, to have them proceeded againſt on the Informations which thoſe Gentlemen had already canvaſs'd againſt them; provided a Prince of the Blood, who in that Caſe is a right Magiſtrate, would be the Chief of the Enterprize. This being approv'd and receiv'd by an unanimous Conſent of the whole Aſſembly, the Prince accepted to be their Chief; on Condition, however, that nothing ſhould be attempted againſt the King, the Royal Family, nor againſt the State; and that he ſhould not be oblig'd to declare himſelf till after the Enterprize had ſucceeded, under the Conduct of him who ſhould be choſe for to execute it under his Authority. This Champion, pick'd among the reſt, was a Nobleman of *Perigord*, call'd *John Godefroy de Bary*, otherwiſe *La Renaudie*, whom the Duke of *Guiſe*, while his Father was Governor of *Burgundy*, made eſcape from the *Conciergerie* of *Dijon*, where he was impriſon'd for Forgery in a Suit of Law which he had againſt the *Greffier du Tillet*. This Man having loſt his Eſtate and his Honour, which he could not recover but in the Confuſion of the State, and the Change of Government, offer'd himſelf to the Aſſembly; who knowing him to be a Man of Reſolution, accepted his Offers; and afterwards the Prince gave him, in good Form, the Power to act in his Name on all Occaſions where it ſhould be wanted to employ his Authority for the *common Cauſe*; promiſing him, beſides, that he would be at Court on the Day appointed for the Execution of the Enterprize, that he might declare it had been done by his Orders.

This thus reſolv'd, *Renaudie*, who ever ſince his Diſgrace at *Dijon* call'd himſelf *La Foreſt*, acted with ſuch Dexterity and Diligence, that he aſſembled, in the Month of *January*, by himſelf and his Emiſſaries, a conſiderable Number of Gentlemen and Deputies of the *Calviniſt* Churches at *Nants*, where they came one after another, each carrying, or having carried after him, a Lawyer's Bag, as if he had *had* a Suit of Law at the Parliament of *Britanny*, which was then held at *Nants*. At this Aſſembly, which was held very ſecretly, and which pretended, falſely, to repreſent the States of the Kingdom lawfully aſſembled, after *Renaudie* had expos'd what had been concluded at *La Ferté*, and which was approv'd here with an unanimous Voice; and he had receiv'd the Oath which he took himſelf reciprocally to act in this important Affair with an inviolable Fidelity, he declar'd, that the *mute Chief* of the Enterprize was the Prince of *Condé*, who had made him his Lieutenant, to act in his Name; and ſhew'd in Writing the Power he had receiv'd. After which, it was deliberated, of the Manner, Time, and Place of the Execution; and it was concluded, that five hundred Gentlemen, and a thouſand Foot, under thirty Captains, who were choſen, would meet, by the 10*th* of *March*, 1560, thro' different Roads, at *Blois*, where the Court was to be at that Time; and, under Pretence of preſenting a Requeſt to the King, ſhould render themſelves Maſters of the Palace, to execute what had been reſolv'd againſt the *Guiſes*; and that Troops ſhould be rais'd in all the Provinces, to oppoſe all thoſe who ſhould undertake any Thing in their Favour.

This is what is related of that Enterprize by all Hiſtorians, both *Calviniſts* and *Catholicks*, the ſole Author of the Additions to the Memoirs of *Caſtelneau* excepted; who, to make his Court to the Houſe of *Condé*, ſays, without any Proof, that the Prince had never ſpoke, nor heard ſpeak of that Deſign.

But, however, I muſt ſay, without the leaſt Prejudice or Partiality, and which I hope will be granted by every honeſt, juſt, judicious, and impartial Reader, both *Proteſtants* and *Catholicks*, that nothing was ever more criminal, nor worſe concerted, nor, alſo, more unfortunate in the Succeſs, than this Deſign. For to pretend to take Poſſeſſion, by Force, of the King's Palace, to ſeize in his Preſence his principal Miniſters, and even kill them, as the Captain *Mazeres*, who had charg'd himſelf with that bloody Execution, confeſs'd it; is it not aiming at the King himſelf, and ſacrilegiouſly attempting to render one's ſelf Maſter of his ſacred Perſon, and of the Government of his Kingdom? And what can be worſe concerted, than to intruſt with a Secret of that Nature, ſo many People, who were to tell it to a thouſand more, in the Provinces where they were going to raiſe Forces to ſupport that Enterprize? Therefore the *Guiſes* were ſoon inform'd of it from all Parts, even by Foreigners, from *Flanders*, *Germany*, *Switzerland*, and *Italy*, without minding thoſe repeated Advices, thinking the Thing impoſſible, and far from all Likelihood, till they were inform'd of all the Particularities of that Conjuration by a *Calviniſt* Advocate, to whom *Renaudie* himſelf, who lodg'd at his Houſe at *Paris*, had diſcover'd it.

Then the *Guiſes* found it very eaſy to diſſipate a Conſpiracy ſo ill conducted, by ſeizing almoſt all the Conſpirators. To diſconcert all their Meaſures, the Court went to *Amboiſe*; a vaſt Number of Nobility was aſſembled; the *Gendarmerie* was order'd to keep themſelves ready to march; Guards were poſted at all the Gates; and as the new Project *Renaudie* had form'd, ever ſince the Court had left *Blois*, was learn'd from one of his Confidents, as far as the *Rendezvous* he had appointed to his Men in the Neighbourhood of *Amboiſe*, to execute their Enterprize on the 16*th* of *March*; they were moſt of them ſeiz'd, without much Difficulty; others were arreſted at all the Paſſages

thro' which they were coming one after another, to be there at the Day appointed. Several of them were hang'd, without any other Formality; others were thrown into the River. *Renaudie*'s Body, who was kill'd while endeavouring to rally his Men, was hang'd, and then quarter'd on the Bridge of *Amboise*; the principal of his Captains were beheaded, after they had confess'd all; as was, also, *La Vigne*, *Renaudie*'s Secretary, who discover'd the whole Secret of that horrible Conspiracy. After which, the Duke of *Guise*, who was to be the Victim, was declar'd Lieutenant-General of the whole Kingdom, the King either present or absent, with a more absolute Power than ever any Body had ever since the *Mairs du Palais*.

But because it was found that this bloody Execution would extend to too great a Number of those Unfortunates, several of whom had been engag'd in the Conspiracy, without knowing what was to be done, an *Edict* of Abolition was publish'd for all those who had arm'd themselves on that Occasion, provided they would retire peaceably in 24 Hours, two and two, or three and three, to their own Houses: But as in the *Interim* three of their Captains, who had arriv'd last, had the Temerity, with the Soldiers they could rally, to attack the Castle, thinking to surprize it; after they had been repuls'd with the Cannon, the general Pardon was revok'd, and the Cavalry detach'd against them, who cut in Pieces those unhappy Remains of the Conspirators. This was the Success of that Conspiracy, which was the Beginning, say the *French* Historians, of those Disorders which *Calvinism* caus'd some Time after throughout the whole Kingdom, by the general Revolt of its Partisans.

As for the Prince of *Condé*, the King having reproach'd him with the *Attentat*, which his Majesty said had been committed, even against his Person; the Prince answer'd, in a Manner conformable to the Greatness of his Courage, by a *Lie*, which he gave in full Assembly, compos'd of all the great Men of the Kingdom, to all those, except the King, the Queens, and the Sons of *France*, who dar'd to maintain that he had made himself Chief of those who could have attempted against the sacred Person of the King, and against the State; offering, besides, his Rank of first Prince of the Blood set *a-part*, to maintain that *Lie*, in a single Combat; but no Body appear'd willing to accept the Challenge; tho' the Duke of *Guise*, that *Lie* was aim'd at, was at least equal in Courage to the Prince, and known for such: But it was not the King's Interest, nor his own, to shew himself sensible of the Affront, which being meant but indirectly to him, and conceiv'd in general Terms, could be very well consider'd as affecting no Body in particular. But as the Prince saw that his Justification could not hinder him from being consider'd as Chief of that Conspiracy, and that he was even narrowly observ'd; he found Means to disappear, and went into *Bearn*, near his Brother the King of *Navarre*. For the *Coligni's*, the Queen-Mother, who had already form'd the Design to make Use of them to *ballance* the Power of the *Guises*, grown formidable to her, hinder'd by her Authority, their being question'd on this Conjuration, tho' every Body thought that they had a Hand in it: So that the Chiefs of the *Calvinists*, who were always on Foot, and in a Condition to raise their Party, appear'd, soon after, says *Maimbourg*, as proud and enterprizing as ever.

In Effect, (according to *Popliniere*, *Dupleix*, and *Mezeray*,) *Mourans* and *Montbrun*, having armed the *Calvinists*, waged War openly, and having wasted, one the *Provence*, and the other the *Dauphiné*, where he seized on *Romans Montelimar*, and even on *Valence*: So that the *Calvinism* was a going to be the reigning Religion in those Provinces, if the Earl of *Tende*, and the Baron *De Lagarde*, on one Side; and on the other *Maugiron*, and *La Motte Gondrin*, the King's Lieutenant in *Dauphiné*, had not run to the Succour of the Catholicks, with old Forces, with whom they dispossessed the two *Calvinist* Chiefs, before they could have had Time enough to fortify themselves in their new Conquests. At the same Time, the *Calvinists*, supported by the Queen of *Navarre*, spread themselves into a great Part of the *Guienne*; and the Admiral, on his Side, to whom his Post gave a vast Power in *Normandy*, maintained them there with so much Authority, that they preached publickly, under his Protection, at *Dieppe*, *Havre*, *Caen*, and some other maritime Towns, and had done the same at *Rouen*, where he had gained some of the principal Officers, if the most considerable of the Parliament had not vigorously opposed it.

All these frequent Enterprizes of the *Calvinists*, obliged the *Guises* to press the Queen that she would consent to the Establishment of the Inquisition, which they thought the most efficacious of all Remedies against *Calvinism*, and which *Henry* II, though a zealous Catholick, could never imagine would suit a *French* Constitution: Therefore the Queen, his Dowager, being of the same Sentiment, would never consent to the Establishment of that, *what you be pleased to call it*, Tribunal.

The Admiral, not at all disconcerted by the strong Opposition, and the frequent Disappointments of those of his Party, presented to the King, in the Assembly of the Notables (held at *Fontainebleau*, in the Month of *August*, to find Means to appease the Troubles) a Request in the Names of all the *French Calvinists*, in which they asked, not only that all Pursuits against them should cease, but also, that they should have the Liberty to build Temples for the publick Exercise of their Religion; and as if the Admiral had been willing to threaten or intimidate the King, he added, that he could have his Request signed (says *Castelnau*, *Mem. l.* 1. *Belcaras*, and *La Popliniere*) by 50,000 Men of the single Province of *Normandy*. He complained also, that the King's Guard had been reinforc'd, which render'd him odious to his Subjects; and which every Body knows is always the Pretext of the Disaffected to a Prince, or his Government, to have him, if they could, at their Mercy; since regular Forces are always the Bulwark of the Throne in a Country divided into Parties.

The Pretext of the Cardinal *De Lorain*, for establishing then the Inquisition in *France*, was, that the Clergy had complained loudly, ever since the Beginning of the Differences in Matters of Religion, that the Laick Judges had usurped an Authority, in judging of the Crime of Heresy, which belonged to the Bishops. *Henry* II, says *Thuanus*, and *Sponde*, to oblige the Bishops, had an Edict issued the 19th of *November* 1549, by which, leaving to the secular Judges the Cognizance of the Crime of Heresy, as to the Fact, with Regard to the Laicks; and to the Bishops, that of Right, when it is a Question to decide, if a Doctrine be heretical, he will, that the Judges after they have proceeded against the accused, should send them to the Bishops, to have them punished according to the Canonical Laws; which proved very advantageous to the *Calvinists*, because the Church cannot dip her Hands in Blood, nor pronounce a Sentence of Death. The Cardinal *De Lorain*, who was not willing they should be dealt with, with so much Meekness and Compassion, obtained, five or six Years afterwards, another Edict, quite contrary to this, by which the ecclesiastical Judges were to proceed against Hereticks, who, after they had been lawfully convicted, should be sent to the secular Judges, to be punished, without Appeal, according to the Rigour of the Ordinances. The Parliament made, on that Subject, several very strong Remonstrances, especially concerning this Clause, *Sans Appel*, without Appeal, which seemed to be of a dangerous Consequence, so that this Edict was not regularly observed.

'Twas for this very Reason that the Cardinal insisted on the Establishment of the Inquisition; but the Chancellor, to avoid that Blow, propoled to the King the

the new Edict of *Remorantin*, which keeping a Medium between the two contrary Edicts of *Henry* II. seems to satisfy equally the ecclesiastical and secular Judges, and to treat severely enough the Hereticks, without having Recourse to the Inquisition, which choak'd the Rights of Parliaments, and of Bishops. For by this Edict, the Cognizance of the Crime of Heresy belongs to the Prelates and their Officers, to the Exclusion of all other Judges; but it orders, likewise, that all those who shall speak of their heretical Dogma's, either in private or in publick, who shall have secret Assemblies, and preach without Leave of the Bishops, write Libels, in Favour of the new Opinions, are to be judged, with their Printers, by secular Judges, without Appeal, and punished according to the Rigour of the Ordinances, as guilty of *High Treason*. This Edict, made at *Remorantin*, in the Month of *May* 1560, pleased every Body, the *Calvinists* excepted, who (says *La Popliniere*, *l.* 6.) called it the *Spanish* Inquisition, though this Edict was never regularly observed; nor the Inquisition established.

The Request, presented by the Admiral, was disapproved by the whole Assembly of the Notables abovementioned, and refuted by the Duke of *Guise*, especially, as to what related to the King's Guard; who said, looking scornfully at the Admiral, that after the Conspiration of *Amboise*, it was necessary for the King's Security, that his Guard should be still stronger, and that to discharge faithfully the Duty of that high Office, it had pleased his Majesty to honour him with, he would take Care that those who presented such Requests, *displeas'd at that Guard, should never be in a Condition to force the King's Palace to render themselves Masters of his sacred Person, and murther his Ministers.* The Cardinal of *Lorain*, added to this (the better to confound the Admiral, who had boasted that he had 50,000 Men ready to sign the Request of the *Calvinists*) that the King had several Millions of Men to oppose them. Then he concluded (say *Dupleix und. Franc.* II. p. 619. *Spond. ad Ann.* 1560, *N.* 16. *Mezeray*, *Tom.* 2. *p.* 785. *Extract. from La Poplin. l.* 6. *p.* 104. *Belcaras*, *l.* 28. *p.* 946.) by saying that, far from being frighted at their Menaces, he took them to Honour, as well as the Hatred and Animosity of those whose Request had been presented by the Admiral. That *at* Paris, *and in all the Provinces, an infinite Number of* Libels *had been published, full of the most atrocious Invectives, and dreadful Menaces against him the Cardinal, and the Duke of* Guise, *his Brother*; *that he had twenty two of them which he kept carefully, and took Pleasure to shew them, as so many convincing Proofs, of his Zeal for his Religion, and of his inviolable Fidelity for the Service of the King, who had been pleased to choose them for his Ministers.*

Maimbourg says, that he has seen a Collection, in ten Volumes, in *Folio*, of all the Satyrs and Lampoons, wrote by the *Calvinists* of those Times, against the Kings, *Henry* II. and *Francis* II. Queen *Catherine*, when she was not in an Humour to favour them, the King of *Navarre*, ever since he joined with the Catholicks, and especially against the Duke of *Guise*, and his Brother the Cardinal of *Lorain*, Archbishop of *Reims*; wherein (says the same Author) all the most flagrant Invectives, atrocious Calumnies, and supposed Crimes, *&c.* are display'd without Judgment or Wit.

The Cardinal, however, whose Soul was as great as his Genius and Capacity (says *Castelnau*, *l.* 1. *c.* 7.) would never be revenged of those infamous Libellers, otherwise, than by despising their impotent Fury and Rage.

Moreover, the Assembly having rejected the Request of the Admiral, it was concluded, that all the Bishops should come to Court the 10*th* of *January* of the Year following, to go from thence, all together, to the general Council, or to assemble a national one; which was the Cause why Pope *Pius* IV. deferr'd no longer to re-establish that of *Trent*. Mean while, the *States* of the Kingdom were convok'd, first to *Meaux*, and afterwards to *Orleans*, for the Month of *December*; in a Word, all Measures were taken to abolish entirely *Calvinism* in *France*, had they not been disconcerted by the unexpected Death of the King, which happen'd the 5*th* of *December*, 1560, caus'd by an Abscess in his Head, which could never be discharg'd thro' the Ear where it had took its Course.

I have judg'd proper to enter into this Detail, to shew the Reader in what Manner *Calvinism* was introduc'd in *France*; the Pretext, as we have seen, was, the Reformation of the Church, wherein several gross Abuses had been introduc'd, by the Depravation of Manners, the Ignorance and Indolence of the Clergy. But, say the most impartial, and most moderate Authors, such Reformation could have been very well effected, by the same pacifick Method practis'd by the *Christian* Church, ever since its Infancy, to those Times of Confusion and Trouble, without having Recourse to the same violent Means us'd by the *Arians*, *Nestorians*, &c. The Convocation of Councils, which is of apostolical Institution, was, say they again, the sole specifick Remedy for those Evils, and thought such by the Apostles themselves; who, far from having Recourse to Fire and Sword to establish the *Christian* Religion founded by *Christ* himself, on Humility, Patience, and Resignation, would have their Disciples employ no other Arms amidst the most cruel Persecution of Tyrants, than their Tears and Prayers; which prov'd more advantagious to *Christianity*, than if the *Christians* had attempted to repel Force by Force; which they could have done with a far greater Appearance of Reason, since it had been endeavouring to establish the Kingdom of *Christ* on the Ruin of that of *Satan*, which our divine Saviour was come to destroy, if Violence, and Revolt against the superior Powers, had not been contrary to the fundamental Principles of his divine Doctrine, and to the rare Example himself had given us, when *carried like a Lamb* to the Slaughter, *without* so much *as opening his Mouth*; and who paid for himself and St. *Peter* the Tribute to *Cæsar*. What Difference, continue the same Authors, between this Conduct, and that of the Reformers? Our divine Saviour will not employ his infinite Power and Authority to destroy the idolatrous Worship of Idols; and the *Calvinists* usurp one to destroy those who adore the true God with them; he who is King of Kings, and by whom the Princes of the Earth reign, and administer Justice, would himself give an Example of the Obedience and Submission due to those temporal Rulers of the Earth; and those who are born Subjects of those Princes, not only refuse to obey, but have also the sacrilegious Temerity to attempt to over-rule them, which made the most impartial judge, that Ambition is the only Motive they are actuated by, and that of Religion employ'd only as a Cloak to steal the other from the Vulgar, who are not always bless'd with the greatest Penetration, or most just Discernment, but rather seldom mind any Thing besides an outward Appearance.

For my Part, was I permitted to give my Opinion in those difficult and interesting Cases, I think it very inhuman to persecute Mankind for their Religion, or to force them into a Road to Heaven, different from that they are pleas'd to chuse themselves; since they are the most interested, or, to speak more properly, the only ones interested in that Affair; we shou'd not, 'tis true, lead them to the Precipice, nor even suffer them to run to that Precipice, if it was in our Power to prevent it; but we should not, neither, throw them into that Precipice, under the specious, or rather perfidious Pretence of deterring them from it. For Example, we believe that Heresy is one of those great, and but too much frequented Roads which lead into Hell; we would have no Body follow that dangerous, and most fatal Road, which to prevent, as much as it is in our Power, we are so *christianly* kind, that we show to those already engag'd in it the imminent Dangers they are running into; and if they continue

in their Obſtinacy of following it, notwithſtanding our Care, and charitable Monitions, we erect Gibbets and Scaffolds, and light Fire on that Road, under Pretence of ſtopping their Journey, when even in our own Opinion, it muſt be the ſureſt Means to precipitate them ſooner into the Abyſs we would have them avoid; whereas, had we continu'd our charitable Monitions, without taking thoſe violent Methods, we had given them Time to reflect on their own unhappy Condition; and if they had not made a good Uſe of it, and had continu'd in their Obſtinacy, we could not have reproach'd ourſelves with having been acceſſory to their Damnation, ſince we had done all in our Power to ſave them. Beſides, it would be ridiculous to ſuppoſe, that, were they even to change thro' ſuch violent Means, that ſuch Converſion could be ſincere, and we muſt be convinc'd, that Want of Sincerity, on thoſe Occaſions, is of no Utility. The Apoſtles never us'd ſuch violent Means to eſtabliſh the *Chriſtian* Religion, elſe they could never have made ſo vaſt a Number of Proſelytes; 'tis true, that they had no Power; nor even when the Church had that Power under the firſt *Chriſtian* Emperors, has ſhe thought it agreeable to *Chriſtianity*, to employ it to force People to believe againſt their own Wills.

But, on the other Side, *Chriſtian* Subjects ſhould not have the ſacrilegious Temerity to attempt to eſtabliſh a new *Chriſtian* Opinion by Fire and Sword, on the Ruin of the Throne of their Sovereign, and the Devaſtation of their Mother-Country, eſpecially a *Chriſtian* Country, and againſt the Will of the Prince, and the fundamental Laws of the Kingdom; which unjuſt and cruel Method, *Calviniſts* are to this Day reproach'd with by all the moſt impartial Hiſtorians of thoſe Times, with having follow'd in *France*, and of having made of that flouriſhing Kingdom, for a long Series of Years, and at different Times, a dreadful Theatre of Conflagration, Blood, and Slaughter.

'Tis pretended, that *Calviniſm* was eſtabliſh'd in the ſame Manner, and by the ſame bloody Means, in *Scotland*, *England*, the Low Countries, *&c.* and tho' I will not pretend to affirm that the Accuſation is juſt, I'll give here an imperfect Sketch of the Conduct of the *Calviniſts* in thoſe different Kingdoms, taken partly from *Calviniſt* Authors themſelves, of what was tranſacted in thoſe different Kingdoms on that Occaſion; beginning with *Scotland*.

The *Roman Catholick* Religion, which (ſay *Leſly*, *Hiſt. Scot. l. 9. Georg. Cone*, *de dupl. Stat. Relig. apud Scot. l.* 2.) which had flouriſh'd for the Space of twelve hundred Years in *Scotland*, was yet practis'd there towards the Middle of the *16th* Century, thro' the Care *James* V, a zealous *Catholick*, took to hinder the *Calviniſm*, which had already begun to introduce itſelf into *Scotland*, from taking Root in that Kingdom. For he not only, by *Edicts*, routed out the *Calviniſt* Apoſtles come from *Germany* and *France*, but he had thoſe burnt, without Mercy, and without Diſtinction of Perſons, who profeſs'd the new Doctrine; to deter others from following their Examples. So that tho' ſome of the Nobility, as well as of the common People, were already very much inclin'd to that Side, none dar'd to declare publickly his Sentiments on that Subject; and notwithſtanding all the Changes which happen'd in *Germany*, *France*, *Denmark*, and *Sweden*, the ſole *Catholick* Religion was permitted throughout his whole Kingdom. That Prince went even further; for ſeeing that *Henry* VIII, his Neighbour, had made *Divorce with the Church of* Rome, ſince that Church refus'd obſtinately to grant him one; *James* aſſembled the States at *Edinburgh*, and oblig'd them, by his Authority, and much more by his Example, to proteſt and ſwear ſolemnly, as he did himſelf, that they would always ſtedfaſtly abide by the *Roman Catholick* Church, their Mother, from whom they had receiv'd, with the *Catholick* Faith, the Life of the Soul: And tho' *Henry* was his maternal Uncle, (for this *James* was Son of *Margaret*, the eldeſt of *Henry* VIII's Siſters) he refus'd henceforward to have any Commerce with him, and preferr'd War to it; in which Reſolution he perſiſted to his Death, which happen'd in 1542, thro' Sorrow of having been abandon'd by the principal Officers of his Army, who (ſay our Hiſtorians) had been debauch'd by the *Engliſh*.

His Death prov'd fatal to the *Roman* Church, which from that Time began to loſe a great deal of Ground in *Scotland*, having no longer that Prince, who maintain'd it by his Authority and Zeal. The *Calviniſm* which had been kept conceal'd all this while, began to appear throughout the whole Kingdom, as publickly as if it had been the reigning Religion of *Scotland*; and this by the Connivance of the Earl of *Arran*, Governor of the Kingdom; for he not only forbad (ſays *Leſley*, *l.* 10) proſecuting thoſe who profeſs'd the new Doctrine, but he ſuffer'd, likewiſe, that they ſhould have full Liberty to appear in publick, and profeſs their Belief. He even granted to one of the new Apoſtles the Liberty of preaching in *Edinburgh*, to which he aſſiſted in Ceremony, accompanied by the greateſt Lords of the Kingdom; which was as a Signal of the Liberty granted to every Body to profeſs the new Religion. The Earl acted thus becauſe he was already a ſecret Partiſan of the new Doctrine, which afterwards he profeſs'd publickly; or becauſe he thought, that by granting tacitly Liberty of Conſcience, he could eaſier obtain for *Edward*, Prince of *Wales*, the Daughter of the late King, as he had promis'd to *Henry* VIII, his Father.

This Princeſs was *Mary Stuart*, which her Father, King *James* V, had *had* of *Mary* of *Lorrain*, his ſecond Wife, the *Guiſe*'s Siſter, and who was but ſeven Days old when the King her Father died. *Henry* VIII, unwilling to loſe ſo favourable an Opportunity of uniting the Crown of *Scotland* to that of *England*, aſk'd this Princeſs for his Son *Edward*, and gain'd the Governor for that Purpoſe. But the Queen Dowager, who was *French* in her Heart, diſconcerted their Meaſures, as ſhe did again five Years after, when *Edward* become King, came to aſk her himſelf, but rather as an Enemy than as a Suitor; having advanc'd, for that Purpoſe, at the Head of a good Army on the Frontiers, while *Henry* II, King of *France*, was aſking her for his Son the *Dauphin*. But Queen *Mary* of *Lorrain* remonſtrated, in ſo pathetick a Manner, to the *Scotch* Lords, (ſays *Caſtelnau*, *Dupleix*, and *Mezeray*) that their Honour and Intereſt oblig'd them to prefer, on that Occaſion, the *French*, their antient and perpetual Allies, ever ſince ſeven or eight hundred Years, to the *Engliſh*, who had always been their Enemies, and had ſo often wag'd War againſt them, and wanted them rather for Slaves, than for Subjects: That they reſolv'd, at laſt, their young Princeſs ſhould be given to the King of *France* for the *Dauphin*. Afterwards, for greater Security, *i. e.* in 1548, ſhe was carried into *France*, where, ten Years after, *i. e.* in 1558, being then in her *16th* Year, ſhe was marry'd to the *Dauphin*, aged 15; who the Year following, 1559, ſucceeded the King his Father. It was then that this young Queen, being of an Age to diſpoſe of the Affairs of her Kingdom of *Scotland*, declar'd Regent the Queen her Mother, *Mary* of *Lorrain*.

But as during the long Interval of 15 Years of the Government of the Earl of *Arran*, *Calviniſm* had gain'd an extraordinary ſtrong Footing in *Scotland*; the Chiefs of that Party, who would be ſecure in that Change, preſented a Petition to the Queen Regent to obtain by an Edict what they had enjoy'd, till then, but by Toleration. But while the Queen was deliberating on that Subject, *John Knox*, one of thoſe Monks and Prieſts who in thoſe Times of Confuſion were glad of the Occaſion of deſerting their Convent, and newly come from *Geneva*, began to preach *Calviniſm* publickly at St. *John's Town*, in ſo ſeditious a Manner, ſay our Hiſtorians, that having, ſoon inſpir'd his Audience with the ſame Zeal againſt the *Roman* Church; the People run to Arms, throughout the

the whole City, and their Zealot at their Head, went to plunder the Churches and Monaſteries, pulling down the Altars, breaking the Images, &c.

Conæus, *l.* 2. and *Leſley*, *Hiſt. of Scotl. l.* 1. ſay, that the Regent, ſurpriz'd at that ſudden Fury, would have (by her Preſence, her Care, and amicable Means) ſtopp'd its Courſe; but that the Earl of *Argyle*, and the Prior of St. *Andrew*, *James Stuart*, natural Son of the late King, afterwards Earl of *Murray*, having put themſelves at the Head of the Rebels, with the Troops they had rais'd, acted every where in the ſame Manner, and even at *Edinburgh*, of which they took Poſſeſſion; and where, after having plunder'd the royal Palace, and ſeiz'd on the publick Funds, they eſtabliſh'd a new Government, declaring themſelves the Chiefs thereof, and aboliſhing that of the *Regent*. But that Princeſs, having join'd to the *Catholicks* who had run to her Aſſiſtance, the ſmall Succours ſhe had receiv'd from *France*; preſented her ſelf before *Edinburgh*, where the Rebels having not Courage enough to come out, and fight her, they judg'd it more proper to enter into a Treaty of Peace, which the Regent herſelf deſir'd, and which they accepted, on theſe Conditions: *That the* Calviniſts, *except thoſe who were Citizens of* Edinburgh, *ſhould quit the Town; and all that had been plundered from the royal Treaſure, reſtor'd: That neither the Churches, nor the Prieſts, ſhould be henceforward inſulted, nor the Miniſters diſturb'd in their new Religion; and that it ſhould be free for every Body to chuſe what Religion they liked beſt.*

This Peace, ſay *Balcaras*, *l.* 8. and M. *Le Labourer. Addit. aux Mem. de Caſteln.* was diſapprov'd by the Cardinal of *Lorrain*, who, according to his fiery and impetuous Temper, would have had always Things carry'd further than his Brother the Duke, much more moderate, tho' much more couragious, could deſire. However, as this prudent Brother had a very great Regard for the Cardinal, and the *Scotch Calviniſts*, who wax'd every Day ſtronger, continu'd their Diſorders againſt the Treaty, he conſented that two thouſand Men of *Renfort* ſhould be ſent into *Scotland* under the Command of the Lord *De la Broſſe*, Knight of the King's Order of St. *Michael*, a very good Captain, and the *Guiſe*'s Creature, with *Nicholas* of *Pelvé*, Biſhop of *Amiens*, entirely devoted to their Houſe. Theſe, according to the Order they had receiv'd, oblig'd the Queen Regent to take a quite contrary Method, by forcing every Body to go to *Maſs*, and confiſcating the Eſtates of thoſe Lords who ſhould refuſe to obey. This violent and avaricious Conduct had ſoon ſpoil'd all; for the greateſt Part of the *Scots*, a warlike Nation, and who, above all, love their Liberty, which they thought was going to be entirely raviſh'd from them, together with their Eſtates, began the War with more Fury than before, aſſiſted therein by *Elizabeth*, Queen of *England*; who ſent an Army into *Scotland* under the Conduct of *Norfolk*; who having join'd the Rebels, laid Siege to *Leith*, which was gallantly defended by old *La Broſſe*, at the Age of 75; and the young *Sebaſtian* of *Luxemburg*, Viſcount of *Martigues*; till the Peace was concluded at *London* between the *French* and *Engliſh*; which Peace prov'd very advantagious to the *Calviniſm* in *Scotland*.

Four or five Months after this Treaty, concluded in 1561, the young King of *France*, *Francis* II. happening to die, the Queen, his Widow, whom *Catherine* of *Medicis* would ſuffer no longer in *France*, was obliged to return into her Kingdom; the *Guiſes*, her Uncles, who dared not to retain her, for Fear of ruining themſelves, perſuaded her, that her Return was abſolutely neceſſary, eſpecially to appeaſe, in her Kingdom, the Troubles cauſed by the Difference of Religion; which, in Fact, was true enough, and could eaſily have been effected, if the poor Queen had returned with as many Forces, as were neceſſary to have herſelf obeyed by the Rebels; but the Queen-Mother, who hated her, had her only conducted by all that was the moſt conſiderable at Court, as far as *Calais*, and by few, as far as *Edinburgh*, who ſoon after returned into *France*, and left her alone in her Kingdom, a Prey to her Enemies, and eſpecially to her Baſtard Brother, *James Stuart*, Earl of *Murray*, the moſt perfidious Man, ſays *Brantoſme*, of his Time, and who, in Concert with the *Calviniſts*, ſupported by Queen *Elizabeth*, did all he could to diſtreſs her, or by open Force, or by Artifice, obliged her at laſt to fly into *England* for a Sanctuary, near her Couſin *Elizabeth*, where at laſt, after 19 Years Impriſonment, ſhe found an Ax and a Block. This fatal Blow eſtabliſhed *Calviniſm* in *Scotland*, upon ſo firm and permanent Foundations, that it has reigned, ever ſince, with as much Power, in that Kingdom, as in any other Part of *Europe* where it is profeſſed.

Calviniſm was introduced in *England*, under the Reign of *Edward* VI; 'tis true that his Father *Henry* VIII. had, before him, ſhaken off the Yoke of the Court of *Rome*, and declared himſelf Chief of the *Anglican* Church, notwithſtanding which, he always remained a mortal Enemy of the *Lutherans*, *Zuinglians*, and *Calviniſts*, whom he had rigorouſly puniſhed. He even had a national Council aſſembled in 1536, wherein the ſix principal Articles, maintained by the *Roman* Church, againſt thoſe new Reformers, were approved of, *viz.* the *Tranſubſtantiation*, *the Maſs*, *the Communion*, *in one Kind*, *for Lay Men*, *the Celibacy of the Eccleſiaſticks*, *the Validity of the Monaſtick Vows*, *and the auricular Confeſſion*, which he had obſerved 'till his Death, before which he had Maſs celebrated in his Chamber, adored the Sacrament, and received it in one Kind. But as the Protector and Regent, *Edward Seymour*, during *Edward*'s Minority, was a *Zuinglian*, he had his Pupil educated in that Belief. He afterwards forbid the Catholicks preaching, wreſted the Univerſities from them, and had the Foundations of a new Church erected by the Parliament; in Part *Lutheran*, and in Part *Zuinglian*, and *Calviniſt*; which were deſtroyed at Queen *Mary*'s Acceſſion to the Throne, at King *Edward*'s Death in 1553, after he had reigned ſeven Years; and which were reſtored in five Years after by her Siſter *Elizabeth*, who ſucceeded her, and who reaſſumed the Primacy of the Church of *England*, which *Mary* had renounced, which Church ſhe edified, in the flouriſhing State it has appeared ſince; though Mr. *Chambers* ſays, that ever ſince that glorious Queen's Death *Calviniſm* has almoſt dwindled away to nothing in *England*, and that the eſtabliſhed Church retains but very little of it.

Calviniſm had alſo, during this Interval, made a very conſiderable Progreſs in *France*; for by the Intrigues of the Queen-Mother, and of the King of *Navarre*, who at the Death of *Francis* II, had been declared Lieutenant-General, the Exerciſe of that new Religion, was tolerated publickly, even in the King's Palace at *Fontainbleau*, where the Queen herſelf, and all the Ladies of the Court, uſed to aſſiſt oftner than at the Service of the *Roman* Church, though they appeared ſtill to profeſs the Doctrine of that Church; ſo that very few, the King excepted, went to Maſs, 'till the Conſtable, who, amidſt theſe long and frequent Fluctuations, had always remained a zealous Catholick, complained publickly to the Queen, of this extraordinary Change at Court, which he called criminal and ſcandalous; and when he ſaw that that crafty Princeſs wanted to amuſe him with frivolous Reaſons (as he thought them) he imagined that he could no otherwiſe oppoſe the Torrent, than by entring into a ſtrict Union with the Duke of *Guiſe*, with whom he was then at Variance, on Reaſon of the Enmity which ſubſiſted between the two Houſes of *Montmorency* and *Lorain*; but preferring then the Intereſts of his Religion to thoſe of his illuſtrious Houſe, a Reconciliation was procured between thoſe two great Men, by *James D'Albon*, Marſhal of *St. André*, a Man of a great deal of Wit, bold, enterpriſing, and a very good Soldier, who had acquired a great Reputation, not only in the Field, but alſo in ſeveral Negotiations. M. *Le Labourer* ſays, that theſe

the

three great Men entered into a ſtrict Confederacy to ſave the *Roman* Religion from Ruin in *France*, and that this Confederacy was called afterwards the *Triumvirate* by the *Calviniſts*.

Moreover the Admiral, who was determined to take all the Advantage he could of a Time ſo favourable to his Party, reſolved, by the Advice of the Princes, to preſent to the King, at his Return from *Reims*, where he had been to be anointed, the ſame Requeſt he had preſented to the late King at *Fontainebleau*, to obtain the Liberty of building Temples, and the free Exerciſe of the new Religion, which Requeſt was ſent to the Parliament to be examined, and which was done accordingly; and in Conſequence thereof, an Edict was given in the Month of *July* 1561, at *St. Germain en Laye*, whereby thoſe who profeſſed the new Religion were not to be moleſted, but all Aſſemblies were forbidden, either publick or private, except thoſe of the *Roman* Catholick Religion, 'till the Deciſion of a general Council. But in the States held at *St. Germains*, in the Month of *Auguſt*, the Chancellor *de l'Hoſpital*, a ſecret Partiſan of the new Doctrine, or rather a hidden *Calviniſt* (ſays *Brantoſme*) ſaid, that ſince it was known by Experience, that in the preſent Conjuncture of Affairs it was impoſſible to have the *Edict* of *July* obſerv'd, by which the Aſſemblies of *Calviniſts* were forbidden; the King wanted to know the Sentiments of the Deputies on that Subject, and if it was not more *à propos* to permit thoſe Aſſemblies for the Good of the Peace, till more efficacious Means could be found to terminate the Differences of Religion. This was preſcribing to the two laſt Orders, *viz.* the Nobility and Commons, what they were to ſay, for the Chancellor was then but the Eccho of the Admiral, who had gain'd the greateſt Number of thoſe two laſt Orders on his Side, who conſequently, after they had loudly exclaim'd againſt the firſt Order, *viz.* the Clergy, concluded, that 'till a national Council could be aſſembled, where they would have the King preſide, aſſiſted with the Princes of the Blood; the *Calviniſts* ſhould be allowed to aſſemble publickly, if it was but to deſtroy the Calumnies, they were loaded with, and to let all the World know, that nothing was done among them of thoſe Abominations, of which they were falſely accuſed. But nothing was concluded, on that important Subject, 'till after the famous *Colloquy* of *Poiſſy*, which had been reſolved long before the Convocation of this Aſſembly, for the Reaſons and Intrigues which every Body is not acquainted with, and which I muſt now diſcover.

Ever ſince the Aſſembly of *Fontainebleau*, the Neceſſity of a national Council had been always inſiſted on, to appeaſe the Troubles which the Diverſity of Religions had occaſioned in *France*: But the moſt crafty among the *Calviniſts*, who wanted no Council, to whoſe Deciſions they ſhould be obliged to ſubmit themſelves, undertook to procure a famous Conference, between the Prelates and Catholick Doctors, on one Side, and the *Calviniſt* Miniſters on the other, under the ſpecious Pretence of being willing to be inſtructed, and to find out ſome Way of Accommodation between both Parties, without touching on the Eſſentials of the Chriſtian Religion, thus to reunite all Minds in the ſame Belief. They expected to gain a great deal by this Stratagem; becauſe they perſuaded themſelves, firſt, (ſays M. *Le Laboureur*, *Addit. aux Mem. de Caſtelu. l.* 3. *c.* 4.) that the Truth of the Catholick Faith, which they wanted to oppoſe, ſhould be put in Compromite, and even this would give Room to ſeveral, as they hoped, to queſtion that Truth, and would keep their Minds in Suſpence, which could engage them, in Proceſs of Time, to change their Religion with leſs Difficulty. *Secondly*, That they ſhould not have, then, the Biſhops for their Judges; ſince that Aſſembly being only to confer amicably, on the Points in Controverſy, thoſe Prelates could be there in no other Quality than as Diſputants. They expected, beſides, that their moſt learned Miniſters, having the Liberty to ſay what they would in Favour of their Reformation, they would render it ſo plauſible, by their Doctrine and Eloquence, that moſt of the Courtiers, already inclinable on their Side, would declare openly for the Reform. *Laſtly*, They did not make the leaſt Doubt, that as both Parties would never agree, and the Conference ſhould break off, before any Thing could be concluded, they could make the World believe, that it was becauſe it was impoſſible to refute their Doctrine, or to reſiſt the Strength of their Arguments, and the Paſſages of the Scripture they had quoted to ſupport it.

This being thus reſolv'd among them, they found it very eaſy to perſuade the Queen to agree to it, who wanted more than ever the Friendſhip of the Admiral, not only to have the Regency confirm'd to her by the States, as he had promis'd her; but likewiſe to precaution herſelf againſt the King of *Navarre*, becauſe ſhe had already diſcover'd ſomething which was negotiating ſecretly with him, to make him enter into the Party of the *Triumvirs*, as he did ſome Time after. She promis'd the Admiral in this, all he could reaſonably expect from her; who promis'd her reciprocally, that he would ſupport her with all his Credit to maintain her in her Authority. For the King of *Navarre*, without whoſe Conſent nothing could be done in this important Affair, he was eaſily perſuaded to agree to that Conference, (ſay *Poplinicre*, *l.* 7. and *Sponde*, *ad Ann.* 1564. *n.* 27. and 1573. *n.* 17.) by the famous Lawyer *Francis Baudouin*. This learned Man, who was in very great Eſteem near this King, had brought over from *Germany* the Book of *George Caſſander*, intitul'd, *Of the Duty of a Chriſtian, in the preſent Diviſion of Chriſtians*: In which he pretended to have found Means to reconcile the two Religions, and in which, tho' his Intentions were very good, he could never be ſo happy as to ſucceed. Tho' this *John Baudouin* (who from one of the firſt Diſciples of *Calvin*, had become one of his greateſt Adverſaries, and againſt whom *Calvin* writes with more Bitterneſs) had a very good Opinion of this Book of *Caſſander*, and thought that by following his Maxims and Method both Parties could agree on a Confeſſion of Faith, which could be *orthodox*; therefore he had no great Difficulty to perſuade the King of *Navarre*, who lov'd Peace, and wanted to appeaſe the Troubles of which he was quite tir'd, to conſent to that Conference.

Therefore Queen *Catherine*, and the King of *Navarre*, being both of a Sentiment on that Subject, tho' thro' different Motives, (as it appears in her Letter to the Biſhop of *Rennes*) the King wrote in *April* to all the Prelates and Univerſities of his Kingdom, commanding them to be at *Poiſſy* by the 10*th* of *Auguſt*, or to ſend their Deputies, granting for the ſame Purpoſe a *ſafe Conduct* to the Miniſters of *France* and *Geneva*, and even to the *Proteſtant* Doctors of *Germany*; that every one could ſay freely in the Aſſembly what he thought could be done to procure an Accommodation. So ſolemn a Declaration did not a little allarm Pope *Pius* IV, the Emperor *Ferdinand*, and *Philip* II, King of *Spain*, in the Apprehenſion that ſo celebrated a Conference ſhould chance to prejudice the general Council, which was then aſſembling at *Trent*, where they thought the Deciſion of that Affair ſhould be referr'd. But the Queen took Care to inform thoſe Princes by her Ambaſſadors, that this Aſſembly of Prelates was only to conſult on Things which were to be propos'd to the Council, and that nothing ſhould be done in it, with regard to Religion, without the Pope's Authority.

The crafty Pontiff, unwilling to depend much on the Queen's Sincerity, took the Reſolution to ſend the Cardinal *Hippolytus d'Eſte* Legate into *France*, to ſee that nothing ſhould be tranſacted in that Aſſembly whoſe Deciſion appertain'd to the œcumenical Council; but as the Journey of a Legate, particularly of this who had five or ſix hundred Horſes in his Retinue, is not ſo quick, and the Pope was afraid the Aſſembly ſhould begin without him; his Holineſs ask'd the King, by M. *Rambouillet*, that it ſhould be defer'd

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ferr'd till the Arrival of the Legate. The artful Queen, however, knew ſo well how to retard that Voyage, that tho' the opening of the Conference had been deferr'd for a whole Month, the Legate could not arrive at Court till ſome Time after they had begun, in the Aſſembly, to treat of the principal Points in Controverſy between the *Catholicks* and *Calviniſts*.

This is the whole Secret of that grand Affair, and the ſole Cauſe of that famous *Colloquy* of *Poiſſy*; at preſent it remains to ſee what were the Sequel, and Conſequences thereof.

The Prelates, Doctors, Deputies, and *Calviniſt Miniſters*, being all arriv'd towards the latter End of the Month of *Auguſt*, the *Colloquy* could not begin till *September* following. Before it was open'd, the Miniſters preſented their Requeſt to the King, (ſays *La Popliniere*, *l.* 7.) by which they aſk'd four Things, without which, ſaid they, they could not enter into a Conference with the aſſembled Prelates. The firſt, that as the Cardinals and Biſhops were intereſted in the Cauſe, they ſhould not be allow'd to be their *Judges*. The ſecond, that the King would be pleas'd to preſide in the Aſſembly, accompanied with his Mother and the Princes of the Blood; to have the neceſſary Order obſerv'd. The third, that all Differences ſhould be judg'd by the Word of God contain'd in the Old and New Teſtament. And, laſtly, that all that would be ſaid on either Side, ſhould be collected by Copiſts, choſen by both Parties; and whoſe Writings ſhould be conſider'd as authentick.

The ſame Day, the Deputies of the *Sorbonne* humbly deſir'd the Queen, that the *Miniſters* ſhould not be heard, at leaſt in publick, on what they had to ſay in Defence of their Confeſſion of Faith, but by ſome who ought to be Judges of thoſe Affairs, and no Body elſe. But the Queen anſwer'd, that the King having engag'd himſelf to give them a publick Audience, he could not retract his Promiſe. And while the *Sorbonne* was thus refus'd, the granting of their Requeſt, the Miniſters obtain'd all they had aſk'd for, and the Under-Secretaries of State were appointed to collect faithfully what ſhould be ſaid on either Side.

Therefore the next Day, which was the *9th* of *September*, the Aſſembly was open'd in the *Refectory*, or Dining-Hall, of the Nuns of *Poiſſy*; at the upper End whereof the King was on a Throne, having on his right Hand the Duke of *Orleans* his Brother, the King of *Navarre*, and the Prince of *Conde*; and on his left the Queen-Mother, Madam *Marguerite* the King's Siſter, and the Queen of *Navarre*; and behind them, on the right and left, in a very great Space left betwixt the Throne and the Wall, taking the whole Breadth thereof, the Lords and Ladies of the Court: On both Sides, the whole Length of the Refectory, were ſeated, on the right, the Cardinals of *Tournon*, *Lorrain*, and *Guiſe*, and about twenty Archbiſhops, or Biſhops; and on the left, over-againſt them, the Cardinals of *Armagnac*, *Bourbon*, and *Chatillon*; follow'd by as many Prelates as there were on the other Side; behind whom, on both Sides, there were Benches full of Doctors of ſeveral Univerſities, and other Eccleſiaſticks of the Prelates Retinue. The lower End of the Refectory was occupied by a vaſt Number of Gentlemen, eſpecially thoſe of the Gown; behind whom, were rang'd the Guards as far as the Wall, to prevent any Diſorders happening in ſo great an Aſſembly. Betwixt theſe two Ends, a little lower than the Middle, there were Bars, which ſeparated both Spaces, that no Body ſhould paſs without Order, to that where the King, the Princes, Lords, Prelates, and Doctors, were plac'd.

Every Thing being thus diſpos'd, the twelve Miniſters, choſe among a vaſt Number of others, enter'd, and took Place, where they could, at the lowet End of the Hall: Theſe twelve were accompanied with twenty-two Deputies of their Churches, and of the Deputies of the Nobility and Commons, by whom the Miniſters were introduc'd, to ſhew to all the World that they were, and would always be very well ſupported. The moſt famous among thoſe Miniſters were *Auguſtine Marlorat*, born in *Lorrain*, who had been an *Auguſtine* Monk, and the ſame who was hang'd ſome Time afterwards at *Rouen*; *John Malo*, who had been a Prieſt; *John de l'Eſpine*, a *Jacobine* Fryer; *Peter Vermilli*, of *Florence*, otherwiſe call'd *Martyr*, who had been a regular *Canon* of the Order of St. *Auguſtine*, a very learned Man, and an eloquent Preacher, but ſo inconſtant in his Doctrine, that he was ſometimes *Lutheran*, ſometimes *Calviniſt*, and then *Zuinglian*, as he was then at *Zurich*, where he was Profeſſor of Theology; but the moſt eminent of them all, and who was appointed for the *Speaker* of the whole *Calviniſt* Party, was the famous *Beza*, then Diſciple and Collegue of *John Calvin*; who being too infirm to appear himſelf at that Aſſembly of *Poiſſy*, ſent in his Place the Perſon who was already deſign'd for his Succeſſor.

Boſſu, in *Beza*'s Life, *Florimond de Remond*, *l.* 8. *c.* 17. and *Sponde*, *ad Ann.* 1549. ſay, that *Theodorus* of *Beza* was of *Vezelay* in *Burgundy*, of an honeſt Family, a very well-made Man, having a very fine Shape, a very agreeable Face, a cunning and crafty Look, and all the Manners of a Courtier; which had gain'd him the Eſteem of the Great, particularly of the Ladies, to whom he was always very gracious. As for Wit, it muſt be confeſs'd, that he had a very fine, pregnant, ſubtil, eaſy, and polite one; having taken Pains to cultivate it by the Study of the *Belles Lettres*, particularly of Poetry, wherein he excell'd both in *French* and *Latin*; knowing, beſides, a little of Philoſophy and Law, which he had learn'd in the Schools of *Orleans*. Several Authors of thoſe Times repreſent him in a quite different Light, with regard to his Conduct; for *Beza* is repreſented by *Boſſu*, *Anſ. to the Apology*; *Baudouin*, *Recan. ad Calvin. Reſcius de Sect. Florimond de Remond*, *Sponde*, *Heſſuſius*, and *Mezeray*, as the greateſt *Libertine* of his Time; profane, cruel, blood-thirſty, always ready to inſpire the moſt barbarous Attempts, impudent, and plung'd in all Sorts of Debauchery. Theſe were the Miniſters ſent to maintain, before the King of *France*, *Charles* IX, that every Body ought to reform, by their Example, Doctrine, and Manners, according to the Purity of the Goſpel they preach'd.

Having been conducted as far as the Entrance of the Bar which ſeparated the Hall into two, they wanted to advance further, to take Places among the Biſhops, or at leaſt among the *Catholick* Doctors; but they were ſtopp'd ſhort at the Bar, with an Order to ſtand there bare-headed, and to ſpeak modeſtly without Invectives, when they ſhould propoſe what they had to ſay. This done, the King ſaid, in a few Words, (ſay *La Popliniere*, *Aubigne*, *Mezeray*, &c.) that he had convok'd the Aſſembly to put an End to all the Differences, in Matters of Religion, which had ſo long diſturb'd the Peace of his Subjects; and that he would not have the Aſſembly terminated before the Accompliſhment of ſo great, and ſo good a Work. The Chancellor being ſeated on a low Seat, further towards the Middle of the Hall, on the right Hand of the King, ſpoke to explain his Majeſty's Intentions, and ſhew'd again, on this Occaſion, as he had done on all others, that he was both the Son of a Phyſician, and Friend of the *Calviniſts*. He ſaid, firſt, that *he hop'd that the Aſſembly would reap the ſame Fruit from the King's Remonſtrance, the Council of* Nice *had done from that of the great* Conſtantine; *that Fruit being nothing elſe but the Reformation neceſſary in the Doctrine and Manners: That to gather ſoon that Fruit, in curing ſo dangerous a Malady*, France *was afflicted with, by thoſe Differences of Religion, a preſent and ſpecifick Remedy ſhould be applied to it, without following the Example of theſe Phyſicians, waiting in a languiſhing State, till the Drugs or Remedies be fetch'd from* Egypt, *or the* Indies; *whereas they could uſe the Herbs gather'd in their own Gardens: Concluding from thence, that they were not to wait for the general Council which was aſſembling at* Trent, *and which would be filled with Foreigners, who were not ſo*

well acquainted with our Diſtempers as we were our ſelves; and that to decide the Points in Controverſy, there wanted nothing elſe but that Aſſembly of Prelates and Doctors with the Calviniſt *Miniſters, who were not to be condemned on ſimple Prejudices, nor treated with Arrogance, as* Alexander, *Patriarch of* Alexandria, *had done* Arius. *That they were to be heard, with Patience, and conferred with amicably; not as Philoſophers, by diſputing, but like true Chriſtians, who do not want ſo many Books, but the Word of God only, to reform by it the Abuſes which ſhall be found to have crept into the Doctrine and Diſcipline, contrary to that divine Word, and againſt the Practice eſtabliſhed by the Apoſtles.*

The Chancellor having ended his Harangue, the Cardinal of *Tournon*, as the moſt antient, and *Primate* of the *Gauls*, ſpoke next, and remonſtrated, that the Chancellor, having propos'd certain Things which were not among the Points contain'd in the Letters, whereby they had been ſummon'd to the Aſſembly, it was juſt that they ſhould be communicated to them, that they might prepare an Anſwer to them. But all he could do, the *Chancellor* would never give a Copy of his Harangue, for Fear, perhaps, of being queſtion'd upon it, if ever the Times ſhould happen to change; and of being convinc'd of *Calviniſm* by his own Writings. Therefore the *Calviniſts* having been order'd to propoſe what they had to ſay to juſtify their Belief, *Beza*, who was to be the Orator, or Speaker, ſtanding, and bare-headed, while he recited the two firſt Periods which he addreſs'd to the King; then kneeling down, with all the other Miniſters his Companions, and lifting up his Eyes and Hands to Heaven, he made a long Prayer to the Almighty Father, which he terminated with the Lord's Prayer; then riſing up, continu'd his Harangue, which is ſeen at Length in the Hiſtory of the *Calviniſt* Churches, and is nothing elſe but an Expoſition of their Belief, accompanied with ſome Proofs to eſtabliſh the Points in Controverſy with the *Catholicks*. As he had a very agreeable Voice, an excellent Delivery, and every Body was glad to hear from a Man ſo much valu'd by thoſe of his Party, the whole Myſtery of that new Doctrine which had made ſo much Noiſe in the World; he was heard by the whole Court, not only with Attention, but likewiſe with Pleaſure, and even with Marks of Approbation, till he came to the Article of the *Euchariſt*; for wanting to expreſs in what Manner the Body of *Chriſt* was receiv'd there by Faith, he ſaid, *that the Body and Blood of* Jeſus Chriſt *was as far from the Sacrament, as the moſt diſtant Part of the Heavens was from the Earth.* This Expreſſion of *Beza*, caus'd a great Murmur in the whole Aſſembly, who appear'd extremely choak'd at it; ſo that *Beza*, tho' naturally very bold and intrepid, appear'd very much diſconcerted. The Queen-Mother, though at that Time very favourable to the *Calviniſts*, believ'd her ſelf oblig'd to ſhew her Indignation with the reſt; ſhe even wrote to the Biſhop of *Rennes*, the King's Ambaſſador to the Emperor, with Orders to the Biſhop to inform his Imperial Majeſty of what had happen'd in that Action. She ſaid, that *Beza*, ſpeaking of the Lord's Supper, *had forgot himſelf*, (for theſe are her proper Terms) *in ſo abſurd a Compariſon, and ſo offenſive to the Ears of the whole Aſſembly; that ſhe would have ſilenced him, and ſent all thoſe Miniſters back again, without allowing them to proceed farther, had ſhe not been afraid that departing without an Anſwer, he would have publiſh'd every where that he had gained the Victory.*

Beza, however, perceiv'd very well, that he had diſoblig'd the Queen; for the next Day he gave her, in Writing, a Declaration of the Senſe in which what he had ſaid ought to be underſtood; which Declaration the Queen ſent to the Biſhop of *Rennes*, to ſhew it to the Emperor. In this Declaration he repeated, in formal Terms, what he had ſaid in his Harangue; then added, *that it ought not to be inferr'd hence, that they would exclude* Jeſus Chriſt *of the Sacrament, which would be a manifeſt Impiety.* But, ſays he, *we believe, according to his Word, that tho' the Body of* Jeſus Chriſt *be now in Heaven, and no where elſe; nevertheleſs, we are made Partakers of his Body and Blood, in a ſpiritual Manner, and by Faith, as truly as we ſee the Sacrament with the Eye, touch it with the Hands, and put it into our Mouths.*

His Harangue ended, the Cardinal of *Tournon*, approaching the King, ſaid, that it was really ſurprizing that Miniſter ſhould have been ſuffer'd to offer ſuch Blaſphemies before a moſt *Chriſtian* King, Protector of the *Catholick* Faith, which the Kings his Predeceſſors, ever ſince the great *Clovis*, had always inviolably preſerv'd in their Kingdom. But ſince the Evil was done, he moſt humbly pray'd his Majeſty, that, in order to repair it, he would be pleas'd to hear the ſolid and convincing Anſwer which would be made to it the Day he would be pleas'd to appoint, which was the 16*th* of *September*; when the Cardinal of *Lorrain*, choſen to anſwer *Beza*, made his Harangue; in which he did not amuſe himſelf, ſays *Maimbourg*, to refute in Detail all the Articles of the *Calviniſt* Belief which *Beza* had expos'd at Length, to engage the *Catholicks* into a Diſpute which could never have been ended; but reduc'd the whole to two Points; one whereof is the Principle whereby, continues the ſame Author, all Controverſies are to be terminated, which is the Authority of a ſovereign Judge; and the other is the principal Subject of the Separation of the *Calviniſts*, which made then the ſtrongeſt Impreſſion on the Minds, *viz.* the *Euchariſt*. For the firſt, as *Beza* had ſaid that he would have no other Judge than the Scripture, without minding the Councils any further than they were found conformable to that divine Word, the Cardinal endeavour'd to prove, that acting thus was wanting no Judge at all, ſince the Scripture, being the Law which cannot interpret itſelf; and all the religious Controverſies being founded on nothing elſe but the different Interpretations given to the Scripture, which each Party pretends to have on his Side; there muſt neceſſarily be a living and ſpeaking Judge, to decide by his ſovereign Authority what is Scripture, and which is its true Senſe. He ſaid, afterwards, that this Judge could be no other than the true Church, which is, without Doubt, that wherein were found the firſt Controverſies, before ſhe had pronounc'd on their Differences, and ſeparated from her Communion the condemn'd Party.

For the ſecond, he employ'd, ſays *Maimbourg*, *Beza*'s own Words againſt him, and demonſtrated, that to ſay that *Jeſus Chriſt* is in Heaven, and no where elſe, and notwithſtanding that by the incomprehenſible Virtue of the Faith, he is preſent in the Sacrament, and communicated to us as truly as we touch the Sacrament, and put it into our Mouth; it is to ſay, that he is preſent locally in the Sacrament, ſince the Sacrament is preſent in our Hand, when we touch it; and likewiſe in our Mouth, when it enters into it; and, nevertheleſs, 'tis to ſay, at the ſame Time, that he is not in that Manner in the Sacrament, ſince we are aſſur'd that he is in Heaven, and no where elſe; which, he ſaid, was a manifeſt Contradiction, never to be admitted into the *Chriſtian* Myſteries; concluding, that it was better to ſay, according to the Scripture, that the Body of *Chriſt* was in Heaven, in its natural Extent, and in another Manner, on Earth, in the Sacrament.

Thus the Cardinal of *Lorrain* concluded his Harangue, with the Approbation of the whole Aſſembly, the *Calviniſts* excepted, who, 'twas rumour'd, would be heard no more. But as *Beza* inſiſted that he ſhould have the Liberty to reply to the Cardinal, and the Aſſembly was not willing he ſhould have any Room to complain that he had been refus'd to exhibit the Proofs of what he had propos'd in his Harangue; two Conferences more were held, the 24*th* and 26*th* of the ſame Month, not in publick, before the King, as the firſt had been; but in private, in a Room of the Monaſtery of *Poiſſy*, before the Queen, accompanied with the Queen of *Navarre*, the Princes of the

the Blood, and the Privy-Council. There were five Cardinals on the right Hand, and fifteen or sixteen Doctors behind them, and the twelve Ministers on the left, without the Deputies of their Churches. At first *Beza*, who had very well prepar'd himself for this Action, made a long Discourse of the Church, where he treated of its Nature, Marks, and Authority; from whence he pass'd to the Vocation to the Ministry, and to some other Points, without mentioning, in the least, the Eucharist. He was answered by two very learned Doctors of *Sorbonne*, *Claudius D'Espence*, and *Claudius* of *Xaintes*. But as they run insensibly from one Point to another, without concluding any Thing, which commonly happens in Disputes; the Cardinal of *Lorain*, to remedy that Inconveniency, ordered that they should fix on the Point of the *Eucharist*, which they should not desert, 'till they had agreed on that great Mystery, since that Point once determined, it would be very easy to conclude all the Rest; therefore the Sequel of that Conference, and the whole one of the twenty-sixth was employed on that Subject.

'Twas then that *Peter Martyr*, who, at that Time, professed *Calvinism*, made a long and tedious Discourse in *Italian*, wherein he attempted to refute what the Cardinal of *Lorain*, and the Doctors of *Sorbonne*, had said of the Presence of Christ in the Sacrament. When he had ended his Discourse, the General of the Jesuits, *James Laynè*, who had accompanied the Legate *Hyppolite D'Est* into *France*, as his Theologian, spoke, like *Peter Martyr*, in *Italian*, because that Language was better understood in *France* than the *Spanish*, which was his Mother-Tongue. He directed his Discourse to the Queen, to whom he remonstrated, that *nothing was more dangerous than to treat of an Accommodation with Heretick*s, *whom the Scripture compare to Foxes, or Wolves, in Sheeps Cloathing, because under the pompous Appearance of an ambiguous Expression, they insinuate with Subtilty the Venom of their Heresy, which we authorise in receiving it unawares*; which Sentiment he pretended to support, by the Example of the *Pelagians*, who, to be received into the Communion of the Orthodox, made no Difficulty to admit the Necessity of Grace, for good Works, but they understood by Grace, Nature, which is a gratuite Gift of God without any Merit on our Part. Likewise, said he, the *Calvinists* pretend to confess Christ present in the *Eucharist*, whereby he is communicated to us, but they will have it done in a purely spiritual Manner, and by Faith, and that Christ's Body is in Heaven, and no where else; which was a Contradiction. He added to this, *That if the Calvinists were to be treated with, it was not to be done in that Assembly of* Poissy, *which had not the infallible Assistance of the Holy Ghost, but in the Œcumenical Council, which was open, and to whom those Ministers were to be sent to propose their Reasons, which was even conformable to the Council of* Basil, *not rejected by the* Calvinists, *and which do not allow us the Celebration of a Provincial Synod, while the general is open, nor even six Months before 'tis open. That if through a Principle of Charity they would endeavour to convince the* Calvinists, *and shew them their Errors in a regular Dispute, the Queen, Princes, Council, and all other Persons, who did not profess the Ecclesiastical Doctrine, should spare themselves the Trouble of being present at it, since it was not of their Province to judge of those Things which they could not understand, and that they exposed themselves besides to the Danger of receiving some bad Impressions which they could not easily shake off afterwards.*

This Part of the Discourse of Father *Laynè*, in which he blames the whole Assembly, was not heard favourably by the Queen, who could not help shewing that she was offended at it. But however the Father pursued his Discourse, without Interruption; which being ended, *Beza*, who had took Notice of the Queen's being vexed at *Laynè*'s Harangue, told the good Jesuit, with a haughty and scornful Air, that the Queen would not learn of him what she had to do, with Regard to the Council, and that she knew very well how to provide for it. However, so ill received as was this Remonstrance of *Laynè*, it produced the desired Effect, for from that Day forward, the Queen, Princes, and Council, were no more seen at the Conferences. Her Majesty would not even permit that they should be so numerous as they had been, but ordered that three or four, and afterwards five Doctors, on each Side, should confer together at *St. Germains*, to see if they could agree on a Formula of Faith on the Sacrament of the Eucharist. Those Deputies were, of one Part, *John* of *Monluck*, Bishop of *Valence* (a disguised *Calvinist*) *Peter Du Val*, Bishop of *Sces*, and the Doctors *Claudius D'Espence*, *Lewis Boutiller*, and *John De Salignac*; and on the other, these five Ministers, *Beza*, *Martyr*, *Marlorat*, *Des Gallards*, and *De L'Espine*. The Queen had chose these two Bishops, because she knew them favourable to the *Calvinists*; and for the Doctor *D'Espence*, and his two Colleagues, as they had a sincere Desire to gain them by a pacifick Means, she believed they would easier agree among themselves than any other she could have named; but she was deceived in her Expectation; for after five Days of Conference, during which, says *La Popliniere*, *l.* 7. several different *Formula's* had been proposed, and rejected, she was at last presented with one conceived in the following Terms.

We confess, that Jesus Christ, *in his holy Supper, presents us with, gives, and exhibits truly the Substance of his Body and of his Blood, by the Operation of his holy Spirit, and that we receive and eat sacramentally, spiritually, and by Faith, that proper Body, who is dead for us, to be Bone of his Bone, and Flesh of his Flesh; that we may be vivified by it, and receive from it all that's necessary to our Salvation; and because Faith, supported by the Word of God, makes and renders present to us the Things promised, and that by that Faith we take truly and in Fact the true and natural Body and Blood of our Lord, by the Virtue of the Holy Ghost, in that View we confess the Presence of the Body and Blood of him our Saviour, in the holy Supper.*

Lavatherus and *Beza* say, that the Doctor *d'Espence* and his Colleagues agreed with the Ministers in this *Formula* of Faith; but *Sponde ad Ann.* 1561. accuses this *Lavatherus* of Imposture. *Mentitur*, says he, *insigniter* Lavatherus *sacramentarius, cum ausus est scribere, Catholicos cum Ministris consensisse*; therefore if *Sponde* is to be credited, there is a very great Appearance that this *Formula* was canvassed by the two Bishops, and the five Ministers, and had it presented to the Queen, as made with the unanimous Consent of all the Deputies; for it is certain that she received it with great Demonstrations of Joy, not at all questioning, but as it had been made by the Deputies of both Parties, who had agreed on that Capital Point, as she believed, it would be approved of by the Assembly of Archbishops and Bishops, at that Time employed, at *Poissy*, towards restoring the ecclesiastical Discipline in the Kingdom. Her Majesty sent the *Formula* to them the 4th of *October*, by M. *Bourdin*, Secretary of State, to be confirmed in the Assembly, whose Consent she expected, for the Reunion of the Catholicks with the *Calvinists* in the same Belief. But she was very much surprised, when she heard five Days afterwards, that she had been frustrated in her Expectation; for after the *French* Prelates had read that Exposition, they thought to have discovered, says *Maimbourg*, the Venom hidden under the Flowers of certain Expressions, which seemed to say every Thing, and said nothing, what they should have said, to have been accounted Catholicks. Moreover, continues the same Author, to proceed with Prudence, and in the Order and Spirit of the Church, in an Affair of that Importance, they had it examined in an Assembly of the most learned Doctors of the Faculty of Theology, who, after they had weighed all the Expressions thereof, declared, with an unanimous Consent,

ſent, that it was captious, inſufficient, and heretical. Captious, ſay they, becauſe conceived in certain ambiguous Terms, which ſeems to mark the real Preſence of *Jeſus Chriſt*, deſtroyed by others, which make believe what the *Calviniſt* ſay, that he is in Heaven, and no where elſe. Inſufficient, in that it does not expreſs the real Preſence of the Body and Blood of Chriſt, under the Accidents or Elements of the Bread and Wine, gives no Efficacy to the ſacramental Words, nor a Miniſtry to the Prieſt who conſecrates. *Laſtly* heretical, becauſe in ſaying that Chriſt is preſent in the *Euchariſt* by Faith, which ſupported on the Word of God renders us preſent the Things promiſed, 'tis evident that it admits but a Preſence purely ſpiritual, and in Spirit; for if Faith, continued they, cannot make nor render the Things preſent but to the Spirit, ſince by it we conceive only, and believe the Things, ſuch as God tells us that they are, independantly of her, paſs'd, preſent, or to come; thus we believe on his Word that he has operated Miracles during the Courſe of his Predication, and that he'll come to judge the Living and the Dead, though Miracles and the laſt Day be not preſent, out of our Imagination which conceive them, and believe them by Faith; likewiſe, concluded they, *Jeſus Chriſt* is not really preſent in the Sacrament, becauſe we believe it ſo; but we believe it becauſe he is there in Fact, by the omnipotent Virtue of his divine Word, who ſays it, and who does what he ſays, in ſaying what he does.

Thus the Doctors of *Sorbonne*, expreſſed themſelves on the *Formula* preſented by the Deputies, and this Cenſure being aproved of by the whole Aſſembly, they ſent the 9th of *October*, their Anſwer to the Queen, in a Writing ſigned by all the Prelates, wherein they declare, *that to obey the King, they had conſented that* Beza *and his Aſſociates ſhould be heard, that they might be inſtructed of the Truth, as themſelves had deſired it; That it had been done ſufficiently in the learned and moſt catholick Harangue of the Cardinal of* Lorain, *and in ſome private Conferences, where their Errors and Blaſphemies were heard, even in the King's Preſence, to the extreme Sorrow of all honeſt People, and had been ſolidly refuted. That it was then abſolutely neceſſary, that, previouſly to any Thing elſe, they ſhould ſubmit themſelves, touching that Article, to the Judgment of the Catholick Church, and of its legitimate Miniſters, from whom they were obliged to receive, both the Faith, and the Law; That they proteſt, that, without it they'll be heard no more, that they will be conſidered as Obſtinates in their Errors, and in their Revolt againſt the Church, and that they humbly pray the King to baniſh them from his moſt chriſtian Kingdom, where Hereſy has never been ſuffered, in Caſe they refuſe to ſign, without Delay, the* Formula *of Faith, annexed to this Writing.* This *Formula* was conceived in the following Terms.

We believe and confeſs, that in the holy Sacrament of the Altar the true Body of Chriſt is really and tranſubſtantially under the Elements of the Bread and Wine, by the Virtue and Power of the divine Word pronounced by the Prieſt, ſole Miniſter ordained to that Effect, according to the Declaration and Command of our Lord Jeſus Chriſt.

This Declaration of the *French* Prelates was the Concluſion of the famous Colloquy of *Poiſſy*; for as the Miniſters refuſed to ſign this *Formula*, when preſented to them, the *French* Clergy refuſed likewiſe, and with the ſame Reſolution, to hear them any more. The Queen, who had a Sort of intermittent Religion, and was ſubject by Turns to a Paroxiſm of *Calviniſm*, or of Catholicity, according as it ſuited beſt her Intereſt, being at that Time a moſt zealous *Calviniſt*, continued her Protection to the Miniſters, notwithſtanding the Declaration of the Biſhops, and went even ſo far as to procure them that famous Edict of the 17th of *January* 1562, given at St. *Germain* in an Aſſembly of Notables, compoſed of ſome Preſidents, and of two Counſellors of each Parliament of *France*, and was ſealed, without Reluctancy, by the Chancellor, who was one of the principal Authors of it. By this Edict (the firſt made in *France*, ſays *Maimbourg*, for the Toleration of any other Religion, beſides the Catholick, ever ſince the *French* had embraced Chriſtianity) the free Exerciſe of the new Religion was tolerated throughout the whole Kingdom, the wall'd Towns and Suburbs of *Paris* excepted. This Edict could not be verified in Parliament, not even after three *Juſſions*; 'till the Queen having carried the King, the 6th of *March*, to that auguſt Aſſembly, had it at laſt regiſtered by that Royal and abſolute Authority, to which the Parliament could not reſiſt. It was no ſooner verified, but *Peter Ramus*, a celebrated Profeſſor in Rhethorick and Philoſophy broke all the Images which were in the Chapel of the College of *Preſle*, of which he was Principal. This Action, for which an Information was exhibited againſt him, obliged the Parliament, to order by an Arreſt of the 9th of *July*, that all the Officers and Suppoſts of the Univerſity, the Principals, Profeſſors, and Ushers of all the Colleges and Communities, ſhould ſign the *Formula* of Faith, made by the *Sorbonne* againſt *Calviniſm*, in 1542, in twenty-five Articles, and which the Officers of the Court had ſigned already, which was done in that Month and the following 'till the 26th.

Ever ſince the Publication of this Edict, all Differences in Matter of Religion were decided by the Sword; and the Kingdom of *France* became afterwards for ſeveral Years, ſucceſſively, a Theatre of Confuſion, Blood, and Slaughter, where the Son impiouſly dipp'd his ſacrilegious Hands in the Blood of his Father, and bereav'd of his Life, the very Perſon from whom he had received his. Where Subjects were rebellious under a perfidious Pretence of Loyalty, and through a Principle of Conſcience, where the ſacred and immortal Name of the *Prince of Peace* was employed for an Onſet, or *Crie de Guerre*. For in Fact, the *Calviniſts*, to propagate their new Doctrine, and the Catholicks to maintain the antient Religion of the Kingdom, ran to Arms, and had frequent Encounters in the very Streets of *Paris*, which always terminated with a conſiderable Slaughter on both Sides. The *Calviniſts* had then at their Head the Queen, the Prince of *Condé*, and the *Colignis*. And the Catholicks, the Duke of *Guiſe*, the Conſtable, and the Mareſchal of *St. André*, called then the *Triumvirate*.

This *Triumvirate*, to ſtrengthen themſelves againſt the oppoſite Party, which was then certainly the ſtrongeſt, wanted (ſay *Caſtelnau*, *l.* 3. *c.* 6. and M. *Le Laboureur*, *Addit. to the Mem.*) to gain *Anthony*, King of *Navarre*, on their Side, whom they knew to be diſguſted of late with *Calviniſm* and *Calviniſts*, and employ'd in that Negotiation, *Hippolytus d'Eſt*, Cardinal of *Ferrara*, the Pope's Legate; *James d'Albon*, Mareſchal, the moſt dexterous and crafty Politician of his Time; and *Geoffrey* of *Peruſe*, Lord of *Eſcars*, the King of *Navarre*'s Favourite; who all three acted their Parts ſo well near that unconſtant Prince, taking him on his weaker Side, which was Ambition and Intereſt, that they gain'd him, ſay *Le Laboureur* and *Mezeray*, without Difficulty. On this Succeſs, *d'Eſcars* went to *Rome*, where he found Pope *Pius* IV, very well inform'd already by the Cardinal of *Ferrara*, and much irritated againſt the Queen, for favouring ſo viſibly the *Calviniſts*; ſo that he promis'd faithfully to procure, as he did, that the King of *Spain* ſhould give the Kingdom of *Sardinia*, in Exchange for the Kingdom of *Navarre*, to *Anthony*, provided he would declare himſelf Chief of the *Catholick* Party; which Promiſe of the Pope was confirm'd, on the ſame Conditions, to the King of *Navarre*, by Don *Antonio Alvaida*, the King of *Spain*'s Ambaſſador, ſent to him for that Purpoſe; and who aſk'd for a Mark of *Anthony*'s Sincerity in this Affair, that he ſhould begin by baniſhing the *Admiral* and his Brothers from Court.

The King of *Navarre*, who, conſcious of his own Sincerity, could not in the leaſt ſuſpect that of thoſe fair

fair Promiſes made to him, in ſo plauſible a Manner, made no Difficulty to deſert the *Calviniſts*, to reconcile himſelf with the Duke of *Guiſe*, and appear openly at the Head of the *Triumvirate*. The Queen, who, notwithſtanding all her Craft, had not diſcover'd all theſe ſecret Intrigues, was thunder-ſtruck at the firſt News ſhe heard of ſo unexpected a Change. But, however, as it was always her Politicks to ſtand by the ſtrongeſt Party, ſhe was forc'd at this Time to forſake, in Appearance, the *Calviniſts*, and to have the *Admiral* and his Brothers turn'd out; promiſing them, at the ſame Time, that ſhe would always hold a Correſpondence with them and the Prince, if, inſtead of his Brother, he would put himſelf at the Head of the *Calviniſts*, unite, and ſtrengthen themſelves, as they did, to oppoſe the Power of the *Triumvirate*.

But the good Queen found herſelf deceiv'd, as before, in her falſe Politicks; for the *Miniſters* being ignorant of this Myſtery, did break forth againſt her in a moſt violent Manner, and diſſected her, in an infinite Number of monſtrous Libels, they had diſpers'd throughout the whole Kingdom; and the Mareſchal of St. *André*, beſides, having diſcover'd this ſecret Correſpondence ſhe held with the Chiefs of the *Calviniſts*, render'd her ſo ſuſpected and odious, that tho' ſhe preſided in Council, where nothing was concluded but for Form Sake, there were others held in private, where the moſt important Affairs were determin'd without her Knowledge.

The Prince and the Admiral perceiving that the Queen had loſt all her Credit and Authority in the Council, and the *Triumvirate* had render'd themſelves formidable by the Acquiſition of the King of *Navarre*, judg'd that there was no other Way left to maintain themſelves, and their Party, but by open Force; therefore they ſent *James Spifame*, Lord of *Paſſy*, heretofore Biſhop of *Nevers*, to the *Proteſtant* Princes of *Germany*, and to the Emperor himſelf, to aſk them for Succours, and ſhewing them the ſecret Letters the Prince had receiv'd from the Queen; intimating to them, that it was not ſo much for the Defence of their Religion they enter'd into a War, as to obey the Queen, who conjur'd them to deliver her and the King her Son, from the deplorable State they were reduc'd to by the Violence of thoſe who oppreſs'd their Liberty.

This indiſcreet Action of the Prince, of which he expected to reap many ſignal Advantages, prov'd fatal to him and his Party; for it depriv'd him at once of the ſpecious Pretext he had to enter into a War, and of the Good-will and Protection of the Queen, on which he depended, in arming, as he pretended, for her Deliverance; for her Majeſty was ſo irritated at his having diſcover'd her Secret, by ſhewing her Letters to all the World, which ſhe thought burnt, as ſhe had deſir'd it; that ſhe chang'd all her Love into Hatred, and join'd againſt the Prince with the *Triumvirs* her Enemies; who laying hold of ſo favourable an Occaſion, of having her entirely on their Side, ſhew'd her then a greater Deference than they had done before. As ſhe had much Dexterity, ſhe interpreted her Letters to them in a Manner to have perſuaded them, had they not been as cunning as ſhe, that all ſhe had wrote to the Prince was only to perſuade him to quit *Paris*, where he could have caus'd ſome Trouble; and at the ſame Time to juſtify her ſelf, near the Emperor, and the other Princes of *Germany*; ſhe ſent to them Copies of thoſe ſame Letters, with thoſe Explications, in the Margin.

This done, ſhe had a Declaration publiſh'd, (ſay *Popliniere*, *Thuanus*, *Mezeray*, *Dupleix*, &c.) in which the King did let all the World know, that he was perfectly free in *Paris*, as well as the Queen his Mother, who govern'd with all the Authority inſeparable from her Character and Quality, as Regent of the Kingdom; commanding the Prince, and all his Adherents, to lay down their Arms, under the Penalty of being declar'd guilty of High Treaſon. Mean while, the *Catholick* Confederates, acting under the King's Authority, had ſoon rais'd an Army more numerous, and ſtronger than that of the *Calviniſt* Princes; and after ſome fruitleſs Conferences, to find Means of an Accommodation, all Hopes of a Peace being vaniſh'd, each Party was oblig'd to take the Field. And this is the real and true Origin of the firſt Civil War; which, ſays *Maimbourg*, *Calviniſm* caus'd in *France*, to maintain itſelf, in that Kingdom, by the moſt violent Means, againſt all Laws, divine and human, which forbid the Subjects to arm againſt their Sovereign under what Pretence ſoever, much leſs to eſtabliſh a new Religion contrary to that eſtabliſh'd in *France*, ever ſince the firſt Centuries of the Church.

The firſt Hoſtilities were committed by the Prince, who render'd himſelf Maſter of *Orleans*, and ſoon after the *Calviniſts* ſeiz'd (ſay *Caſtelneau*, *La Popliniere*, *D'Aubigné*, *Belcaras*, *Thuanus*, *Mezeray*, *Dupleix*, &c.) in almoſt all the Provinces a great Number of Towns; and among others, *Meun*, *Baugency*, *Blois*, *Tours*, *Angers*, *Poitiers*, *Angouleſme*, the *Charité*, *Bourges*, *Lyon*, *Valence*, *Grenoble*, *Tournon*, *Romans*, *Montbriſon*, and almoſt all the Places of *Guienne*, from the *Dordogne* to the *Pyrenees*; where they ſpar'd nothing, ſacred or profane, conſidering themſelves as Republicans, and declaring publickly, ſays *Montluc* in his Commentaries, that they would *whip that Child who called himſelf King, and have him learn a Trade, to get his Bread.* They even abandon'd themſelves to that Exceſs of Fury and Rage, ſay the Authors of thoſe Times, as to diſcharge their Revenge on the Aſhes of the Dead, even thoſe they ſhould have reſpected moſt; for they violated the Sepulchre of *John*, Grandfather of *Francis* I, at *Angouleſme*; thoſe of the Anceſtors of the Prince of *Condé*, their Chief, at *Vendoſme*; of King *Lewis* XI, at *Clery*; of the bleſſed *Jane*, his Daughter, at *Bourges*; of *Francis* II, at *Orleans*, where they burnt his Heart, depoſited in the magnificent Church of St. *Croix*.

The *Catholicks*, on their Side, had all thoſe they could ſeize, executed; for the Parliament of *Paris* iſſu'd out, one after another, three or four *bloody Arreſts* againſt the Rebels, who were all declar'd guilty of High Treaſon, the Prince excepted. The other Parliaments of the Kingdom did the ſame, ſo that in leſs than four Months, more than 3000 of them paſſed thro' the Hands of the Executioners. By the King's Orders all the *Calviniſts* were baniſh'd from *Paris*, and the *Edict* of *Janvier* was revok'd.

While this was acting, the Army of the Prince being weaken'd by the Deſertion of a vaſt Number of Gentlemen, frighten'd at the violent Meaſures the Government had taken againſt their Party, unable to keep the Field any longer, went to ſhelter himſelf behind the Walls of *Orleans*, waiting there for the 8000 Men Queen *Elizabeth* of *England*, to whom he had deliver'd *Havre de Grace*, had promis'd him.

I will not attempt to relate here all the Particulars of this firſt Civil War, nor of the others which *Calviniſm* caus'd in *France*, under the Reign of *Charles* IX, who was then King; ſince they are foreign to my Subject: All I can ſay on that Subject is, that the *Calviniſts* were always beaten in a pitch'd Battle; as at *Dreux*, by the Duke of *Guiſe*, where the Prince was taken Priſoner; at *Montcoutour*, by the Duke of *Anjou*, afterwards King *Henry* III; at *Jarnac* by the ſame Duke of *Anjou*, where the brave Prince of *Condé* was barbarouſly murder'd, againſt the Laws of Arms, by *Monteſquiou*, &c. &c.

Calvin, who had not appear'd, at leaſt publickly, to interfere in all theſe Troubles, tho' occaſion'd by his new Doctrine; having been tormented for ſeveral Years with a Complication of Maladies, died, at laſt, of an *Aſthma*, in his 56*th* Year, on the 27*th* of *May*, 1564, at *Geneva*, where he had reſided ever ſince the Eſtabliſhment of his new Church. Beſides what I have ſaid already of *Calvin*, it muſt be confeſs'd, that he had a great deal of Wit; and that if we conſider the Strength, Purity, Elegance, Majeſty, Politeneſs, and the Subtilty of his *Latin* Expreſſions, he has

equall'd, if not ſurpaſs'd, in his Manner of Writing, ſome of the moſt learned Men of his Time. *Maſſarion*, who has wrote his Life, ſays, that in order to cultivate his Style, he us'd to read over, every Year, his *Cicero*; tho', in *Maſſario*'s Judgment, his Style is more like that of *Tacitus* and *Seneca*, than of *Cicero*. We muſt confeſs, likewiſe, that he was indefatigable, as we plainly ſee, by the great Number of his Works; watchful, extremely ſober, eating but once a Day, and then but very little; and ſo diſintereſted, that he was contented with a very ſmall Penſion; ſo that he left nothing at his Death, but the Value of two hundred Crowns, his Books and Goods included.

But if *Calvin* had his Perfections, he had likewiſe ſeveral very great Imperfections; for he was peeviſh, paſſionate, and a bitter Satyriſt, as he is reproach'd with by his Friend *Martinus Bucer*; who, in one of his Letters to him, tells him, that he is more like a mad Dog, than like a Man; that he is as mediſant and outragious, as he is polite in his Writings; full of atrocious Invectives, in very fine Terms; and that he judges of Perſons, not according to Truth and Reaſon, but according to the Hatred or Affection he was pleas'd to have for them, and without any other Diſcernment but that proceeding from his blind Paſſion. Moreover, his peeviſh Humour, which ſeldom forſook him, had render'd him ſo inſupportable, even to his Friends, that thoſe of *Geneva* comparing his atrabilary Temper with that of *Beza*, always merry and gay, us'd to ſay by a very bad Raillery, which ſmells much of Impiety, that *they ſhould prefer to be in Hell with* Beza, *than in Heaven with* Calvin. Who, tho' he affected a very great Simplicity, and an entire Abnegation of the Pomp of this World, is accus'd, nevertheleſs, by his Contemporaries, with having been the moſt arrogant of all Men, willing to exerciſe an abſolute Empire over the other Miniſters his Collegues, whom he conſider'd as his Pupils, or rather his Slaves; and ſo vain, that he was not aſham'd to make himſelf his own Panegyrick, full of Praiſes he beſtows upon himſelf, in his Anſwer to the learned Lawyer *Baudouin*; who reply'd to it in theſe few Words, *Calvinus mihi veniam det, ſi non poſſum credere vanitati*; i. e. *Calvin* will be pleas'd to excuſe me if I cannot believe in Vanity. But what he is moſt reproach'd with, by the moſt impartial Authors, and which will render his Memory odious to all good *Frenchmen*, is, his having been the Cauſe, by his Doctrine, of the Deſolation of his own Country, which his Diſciples, inſpir'd with his Spirit, undertook to propagate by Arms; which they have ſo often taken againſt the Kings, to whom *Jeſus Chriſt* commands us to be as perfectly obedient, as himſelf was to *Ceſar*: *Tantum enim malorum intulit in patriam* (Calvinus) *ut cunabula ejus merito deteſtari, atque odiſſe debeas.* For his Perſon, *Calvin* was of a middle Stature, had a long Viſage, was tawny, and very lean; had black Hair, a ſonorous and ſtrong Voice, quick Eyes, an aquilean Noſe, and his Beard was thin and long. He was bury'd without any Ceremony, according to the Laws of his new Sect; but his Doctrine was not bury'd with him: On the contrary, it made after his Death new Conqueſts, eſpecially the moſt conſiderable one of the united Provinces, which was effected in the following Manner:

What the *French* have called ſince the firſt Troubles of the Kingdom, and which we have heretofore mentioned, having been pacified by the Edict of *March*, 1563, the King's Authority being then acknowledged throughout the whole Kingdom, and the Places which had been poſſeſſed by the *Calviniſts* having returned under his Majeſty's Obedience, the *Germans* having been ſent into their Country, and the Peace concluded with *England*: The Queen reſolved, ſays *Caſtelnau*, *L.* 5. to carry the King with the whole Court through moſt of the Provinces, in making the Tour of *France*. For that Effect they departed from *Fontainebleau* towards the latter End of *March*, 1564, which was the firſt Year which begun, by the Month of *January*, according to the Edict made to remedy to the Inequalities ſeen in Years when they begun, as before, at *Eaſter*, which is a moveable Feaſt. However, the Queen undertook this Journey to reſtore the good Order every where, and to revive in the Hearts of the People their natural Love for their Royal Sovereign, by preſenting him to them. Perhaps there was alſo ſome other ſecret Deſign hidden in this Journey, which could never be diſcovered; the Truth is, that it happened then, ſeveral Things, from which the Chiefs of the *Calviniſts* inferred, or ſeem to have inferred, that their Ruin was reſolved upon.

'Tis true, that the Queen was then very much changed with Reſpect to them; for though ſhe flattered the Prince with Hopes, to engage him to conclude the Treaty of *Orleans*, ſhe hated him in her Heart, ever ſince he had diſcovered her Secret to the whole Earth: She miſtruſted much the Admiral, who, by endeavouring to oppoſe the Concluſion of the Peace, had ſhewed that he had a great deal of Ambition; and as ſhe governed then with an abſolute Power, ſhe feared always that the Prince, governed by the Admiral, would at laſt have the ſame Part in the Government her deceaſed Brother, the King of *Navarre*, killed at the Siege of *Rouen*, had. As for the King, beſides his being governed by the Queen his Mother, for whom he had the greateſt Reſpect and Deference, and who was then in her greateſt Paroxiſm of Catholicity, he hated the *Calviniſts* ever ſince they had inſulted him, and almoſt beſieged in *Paris*; and this Hatred increaſed to that Exceſs during this Journey, when he ſaw, ſays *Mezeray*, in the ruinated Churches, and in the Sepulchres of his Anceſtors violated, the frightful Marks of their Impieties and Sacrileges, that he could not refrain his Tears, and proteſted that he would one Day puniſh thoſe enormous Crimes with all the Severities they deſerved. We muſt add to this, ſays *Caſtelnau*, *L.* 5. *c.* 10. that the Queen was continually intreated by the Pope and all the Catholick Princes, eſpecially by his two Sons-in-law *Philip* II. King of *Spain*, and *Charles* III. Duke of *Lorrain*, to inſpire the King with a generous Reſolution, to reduce the *Calviniſts* to the Impoſſibility of ever riſing in Arms againſt him, that he might not be reduced once again to the ſhameful Neceſſity of receiving the Law from a Handful of his Subjects, in forcing him to grant by Edict the Eſtabliſhment of Hereſy, to the Prejudice of the glorious Title of *Moſt Chriſtian King*, acquired to him by his Predeceſſors, by fighting with all their Power and Strength the Hereticks, whom they would never ſuffer in their Kingdom.

The King and Queen being perſuaded by thoſe Remonſtrances; it is not at all ſurprizing if the *Calviniſts* were not very well treated during this Journey, though nothing was acted contrary to the Edict of Peace. A ſecond Citadel was erected at *Lyon* againſt the *Calviniſt* Party, which was yet the ſtrongeſt in that City. Orders were iſſued out for the Demolition of the Fortifications in the Places they had been Maſters of during the War; they were forbidden the Exerciſe of their Religion ten Leagues round the Places where the Court was to paſs, though it was permitted in certain Towns by the Edict, which was interpreted, then, *when the King ſhould not be there, or ten Leagues near.* Another Edict was made at *Rouſſillon*, the Seat of the Earl of *Tournon*, by which they were forbidden, under Pain of Death, to touch the ſacred Things, to break the Images, and to hold any Aſſembly but in Preſence of the Officers appointed by his Majeſty for that Purpoſe. The Magiſtrates were ordered to force the Monks and Prieſts who had changed their Religion to have the Liberty to marry, to quit their Wives, under Penalty of the Galleys for the Men, and of a perpetual Impriſonment for the Women. The Conference the Queen had with the *Vice-Legate* in paſſing through *Avignon* cauſed a great deal of Uneaſineſs to the *Calviniſts*, and much more that ſhe had at *Bayonne* with the Duke *d'Albe*; they perſuaded themſelves, ſays *Caſtelnau*,

Caſtelnau, l. 6. c. 1. and *la Popliniere*, that a League had been made between the two Crowns, to exterminate all the *Calviniſts* from the Dominions of the two Kings; and they were the more ſtrengthened in that Opinion, becauſe they knew that the Queen managed then an Interview between her, the Pope, and the Catholick Princes: But however, what confirmed them in the Perſuaſion that their entire Ruin had been reſolved on in the Conference of *Bayonne*, was the Paſſage of the Duke *d'Albe* into *Flanders* at the Head of a good Army, for the Reaſons I am going to mention, by relating in what Manner *Calviniſm* was introduced in the *Low Countries*.

While *Charles* V. lived, the new Doctrine which had began to inſinuate itſelf into thoſe Provinces by their Communication with *Germany*, could never be eſtabliſhed there; becauſe that great Prince, extreamly beloved by his Subjects of the *Low Countries*, whom he governed according to their antient Privileges and Liberties, had his Edicts obſerved among them without the leaſt Difficulty; but *Philip* II. his Succeſſor, deviating from the pacifick Method of the Emperor his Father, and treating thoſe People, very jealous of their Liberties, with a great deal of Severity and Rigour, there happened ſeveral Revolts of the three Orders of this State, and the new Doctrine took Occaſion from thence to propagate and ſtrengthen itſelf in thoſe Provinces. The Nobility, irritated that all Affairs were truſted to the Management of *Anthony de Granvelle* Biſhop of *Arras*, a vaſt Wit, but very proud, though of a low Extraction, formed a League againſt him. The People could not ſuffer, that, againſt the Promiſe made to them, the *Spaniſh* Troops ſhould be kept ſtill in the Country. The Clergy, and eſpecially the Biſhops and Abbots, complained loudly of the Erection of new Biſhopricks, to the Detriment of their Dioceſſes and Abbies, which they maintained was manifeſtly againſt the Rights and Privileges of their Provinces, and all together proteſted, That they would never ſuffer the Inquiſition, which *Philip* wanted abſolutely to eſtabliſh in the *Low Countries*.

'Tis true, that *Philip*, afraid of a general Revolt he was threatened with, withdrew his Troops, and was even obliged to recall *Granvelle*; though, to render him more reſpectable to the *Flemiſh*, he had procured him a Cardinal's Hat; but as he inſiſted on the other Points, and particularly on that of the Inquiſition, the Confuſion continued; during which the *Reformed*, who had kept themſelves concealed, began to appear publickly, and ſoon increaſed, through the Aſſiſtance of a great Number of *Calviniſt* Preachers; the Admiral took Care to ſend into *Flanders* to foment thoſe Diviſions, by preaching *Calviniſm*, and exhorting the People at the ſame Time, to maintain themſeves in their Liberties, which the Pope and King *Philip*, ſaid they, wanted to raviſh from them. The Chiefs of the Nobility declared themſelves openly Protectors of thoſe new Evangeliſts, and of their Proſelytes, the one to gain the Affection of the Populace, and the other, becauſe they were *Calviniſts* already; among whom the moſt conſiderable, the moſt powerful, and the moſt dexterous, was *William* Prince of *Orange*, of the illuſtrious Houſe of *Naſſau*, who, though born of a *Lutheran* Father, appeared notwithſtanding Catholick at the Court of *Charles* V. to maintain his Credit near that Prince, and turned *Calviniſt* under *Philip* II. to ſtrengthen thereby the Party he was forming againſt that Prince, by whom he had been mal-treated; ſo that in a very ſhort Time there happened in the *Low Countries* a great Revolution, in which *Calviniſm* found Means to eſtabliſh itſelf, by Degrees, in the State, we ſee it there at preſent.

In fact, more than two thouſand Gentlemen of thoſe who profeſſed *Calviniſm*, formed a League, in which entred the Admiral and the *Calviniſts* of *France*; four or five hundred of them having at their Head *Henry* of *Brederode*, *Lewis* of *Naſſau*, and the Counts of *Bergh* and *Calembourg*, preſented to the Governeſs *Margarite* Dutcheſs of *Parma*, a Requeſt, whereby they aſked, among other Things, that the Inquiſition ſhould be aboliſhed, and all the Edicts publiſhed againſt the *Lutherans*, *Calviniſts*, &c. Afterwards following the Impetuoſity of their Zeal, they began in *Flanders*, as their Brethren had done in *France*, by arming themſelves, taking Poſſeſſion of ſeveral Towns, breaking the Images, deſtroying the Altars, aboliſhing the Maſs, and exerciſing, ſays *Maimbourg*, all Sorts of Violences and Cruelties againſt Prieſts and Monks.

The Governeſs, a very wiſe Princeſs, who had much more of the good Qualities of *Charles* V. her Father than King *Philip* her Brother, acted during ſix or ſeven Years, to appeaſe theſe Troubles, with a very marvellous Prudence, employing ſometimes the Severity of the Laws, and ſometimes Clemency; ſometimes open Force, and ſometimes Dexterity, according to the Diverſity of Occaſions; moderating the Severity of the Orders ſhe received from *Spain*, ſuſpending the Execution of the Edicts, and gaining by her obliging Manners and fine Hopes ſeveral of the Lords, and thereby breaking the Union; ſo that the moſt mutinous and dangerous, as the Prince of *Orange* and *Brederode*, having retired into *Germany*, and the moſt ſeditious among the People, ſeeing themſelves deſerted by the Nobility, it ſeemed as if the Calm was going to ſucceed the Tempeſt, with the Obedience due to a Sovereign: But the bad Politicks of *Philip*, wholly contrary to ſo wiſe a Conduct, diſſipated all thoſe Hopes, by cauſing a new Revolt, which diveſted him of the greateſt Part of his Dominions of the *Low Countries*.

He had put in Deliberation, in his Council, on the repeated Remonſtrances of the Dutcheſs his Siſter, what Means were to be uſed to keep the *Flemiſh* in their Obedience: Several were of Opinion, that thoſe of Meekneſs and of a reaſonable Condeſcenſion, which had already ſo well ſucceeded to the Governeſs, were the beſt; but the general Inquiſitor, and the Duke *d'Albe*, a very ſevere Man, even to Cruelty, having concluded for the Rigour, *Philip* took that Party, following in it his natural Ferocity, which appeared ſoon after, in the barbarous Manner he treated Prince *Charles* his Son, and the virtuous Queen *Elizabeth* of *France*, his Wife. He ſent the Duke *d'Albe* into *Italy*, whence with an Army of eight thouſand Foot of the old *Spaniſh* and *Italian* Bands, and three thouſand choſen Horſe, he paſſed into *Flanders*, with Orders to eſtabliſh the Inquiſition there, in the ſame Manner it was eſtabliſhed in *Spain*, and to puniſh with the utmoſt Severity, all that had been acted, during the Troubles, againſt God, and againſt the King.

This Man who pleaſed his cruel and bloody Humour, in obeying a King very near of his Temper, except that *Philip* was not ſo brave, nor ſo great a Captain as the Duke, executed his Orders with ſo much Cruelty, and threw the poor *Flemiſh*, whom he uſed like Slaves, into ſuch a Deſpair, that there happened at laſt a general Revolt of all the Orders; who after ſeveral Changes of Governors and Governments, ſeveral Battles and bloody Combats, and ſeveral great Revolutions, terminated, at laſt, in the Eſtabliſhment of a new Republick. It began by the Revolt of the two Provinces of *Holland* and *Zeland*, of which the Prince of *Orange* was Governor, who firſt ſhook off, by a publick Declaration, and an Edict, the *Spaniſh* Yoke, embracing, at the ſame Time, the *Calviniſm*; and afterwards by the Union of ſome other Provinces, entered into the Confederacy. That ſame Republick, together with its new Religion, has inſenſibly increaſed by Sea and Land in *Europe*, and in the *Indies*, to that Pitch of Grandeur and Power, we ſee her at preſent.

Thus far I have conducted *Calviniſm* from its Origin to its Eſtabliſhment in ſeveral Parts of *Europe*; and I hope with that Impartiality, I had promiſed my Reader I would effect, throughout all Narrations of this Kind; though I could not help taking Notice, that it is acting contrary to the true Principles of

Chriſtianity, to pretend to reform the Church of Chriſt by the Sword, ſince that Reformation ſhould be operated in the ſame Manner, that Church was founded at firſt, *i.e.* by Patience, Meekneſs, and an entire Reſignation to the ſupreme Will of the Almighty, even under the moſt excruciating Torments, not that I would pretend to excuſe the violent Means uſed by ſome Chriſtian Princes, to bring all their Subjects into the ſame Belief in Matters of Religion, but let thoſe Means be as they will, they could never be more cruel than thoſe uſed by *Dioclefian*, and the other firſt Perſecutors of the Chriſtian Name; though the *Eccleſiaſtical Hiſtory* does not ſo much as furniſh us with a ſingle Example, of a Sword having been drawn in thoſe Times, to repel Force by Force, or to defend the Chriſtians againſt the Violence of the Perſecution. On the contrary, the Chriſtians of thoſe Days were the moſt loyal Subjects, their Perſecutors and Emperors had throughout their whole Empire, and the beſt Soldiers of their Armies; and though they employed no other Arms for the Propagation of the Chriſtian Religion, but their Patience, Prayers, Blood and Tears, Chriſtianity was ſoon eſtabliſhed throughout the whole Earth, and the Croſs of Chriſt became in Time the greateſt Ornament of the moſt ſumptuous Diadem; while *Calviniſm*, eſtabliſhed by Fire, Sword, Revolt, Devaſtation, *&c.* has almoſt dwindled away to nothing. We deceive ourſelves, if we imagine that we can be devoutly Rebels, or that the Vineyard of the Lord will bear Fruits in a Field watered with the Blood of thoſe, who, like us, have been regenerated in the moſt ſacred one of *Jeſus Chriſt*, of thoſe who were yet the Depoſitories of that ſacred Bath, when we firſt ſeparated from them, and to whom, perhaps, ſome Time or other, we'll be once more reunited.

CANDLE-MAKING.

CANDLE-MAKING, is to cover a Cotton or Linen Wick, looſely twiſted, with Tallow, Wax, or *Sperma-Ceti*, in a cylindrical Figure, commonly called *Candle*, from the *Latin*, *Candela*, and *Candela* from *Candor*, or *Candeo*, I burn; becauſe a *Candle*, when lighted at the End, ſerves to illuminate a Place in the Abſence of the Sun.

From this Definition we may eaſily infer that the Materials neceſſary for this Operation, are Cotton for the *Wicks*, and *Tallow* to cover them with.

The Cotton is bought in Skins, ready ſpun by Chandlers. In the Countries where that Commodity is not eaſily come at, its Want is ſupplied by *Tow*, which being ſpun and whitened, makes as good Wicks as Cotton itſelf. The Threads, either of Cotton or Tow, are winded of three or four together, according to the intended Thickneſs of the *Wicks*, into Bottoms or Clues, whence they are cut out with an Inſtrument, contrived for that Purpoſe, into Pieces, for the Length of the *Candle* required. If the Threads be made of Tow, Care muſt be taken, in cutting the *Wicks*, to pick out and free it of all the ſmall Ruſhes which could have been left in it, and which otherwiſe would make the *Candle* flear, and run; each *Wick*, after 'tis cut, muſt be ſlightly twiſted, and rubbed, with a coarſe Piece of Cloth, elſe it would not keep on twiſted. Then they muſt be put on the Sticks or Broches, then hung up to dry, in ſome Place, near the Fire, or in a Stow; for unleſs the *Wick* be thoroughly dry, the *Candle* will never give a good Light. Thus far for the *Wicks*. At preſent for the *Tallow*.

TALLOW is a Sort of Animal Fat melted down, and clarified. There are ſcarce any Animals but a Sort of *Tallow* may be prepared from; but thoſe which yield the moſt, and whereof the moſt Uſe is made, are the Horſe, Bullock, Sheep, Hog, Goat, Deer, Bear, *&c.* But the beſt *Tallow* for *Candles* muſt be half Sheep's, and half Bullock's; that of Hogs making them gutter, gives an ill Smell, and a thick black Smoke. *Candles* made of Dripping or other Kitchen Stuff, as they call it, are of little or no Service; for beſides that, they give but a very bad Light, they are almoſt as ſoon burnt as they are lighted. In ſome Provinces of *France*, 'tis Part of the Butchers Buſineſs to prepare the *Tallow* fit to be melted for *Candles*, which the *Chandlers* buy from them, without taking that Trouble upon them of poiſoning themſelves, and their Neighbours, with the ſuffocating and nauſeous Smell attending that dirty Operation. The beſt *Tallow* is that which is hard, has a blueiſh Caſt, and when handled does not feel greaſy. This *Tallow* is made by cutting the *Fat* of the Animal, *viz.* of Bullocks and Sheep, into Pieces, (tho' *Tallow* made wholly of *Sheep's Fat* be the beſt, and makes finer *Candles*) and throwing it into a Pot, or Boiler, (in *France* they have braſs Coppers, broad and ſhallow, for that Operation) while 'tis melting it muſt be ſkimm'd of all its Impurities; and when entirely melted, 'tis ſtrain'd thro' a Sieve, made for that Purpoſe, to free it of the Impurities which could have eſcap'd the Skimmer; which is a great deal better Method than that of throwing Water into it to precipitate thoſe Impurities; for the Water communicates a certain Humidity to the *Tallow*, which hinders the *Candles* from burning well, and is the Cauſe why they ſo often crackle and ſpit in the burning. Tho' it be the common Practice here in *England*, where, after the *Tallow* is melted, they empty it, thro' a Sierce, into a Tub, having a Top for letting it out, as Occaſion requires; and uſe it after it has ſtood three Hours. In *France*, as the *Chandlers* buy their *Tallow* ready prepar'd from the Butchers, and never buy but the cleaneſt, they have no other Trouble than that of melting as much *Tallow* as they have Occaſion for, and which melts as clear and fine as Water, without the leaſt Sediment.

Here, among us, the liquid Tallow is drawn off from the Tub, which has a Tap for letting it out into a Veſſel call'd the Mould, Sink, or Abyſs, of an angular Form, like a Priſm, except that it is not equilateral; the Side on which it opens being only ten Inches high, and the others which make its Depth, fifteen. On the Angle, form'd by the two great Sides, it is ſupported by two Feet, and is plac'd on a kind of Bench, in Form of a Trough, to catch the Droppings, as the *Candles* are taken out each Dip. In *France*, their *Mould*, Sink, or Abyſs, is a ſtone Veſſel, glaz'd within and without, of about two Feet long, a Foot and a half deep, and four or five Inches broad a-top. This they fill up from the Copper, or *Poile*, as they call it, wherein they keep their Tallow melted over a very ſlow Fire, to keep it always in a due Conſiſtence, that they may be capable to ſupply the Stock in the Mould, when it begins to be too much diminiſh'd. Before the Artiſt ſets his Mould for the Operation of dipping, he has all his *Wicks* ſing'd over a Flame, to ſinge off all the Nap which could be upon them, which is ſo often the Occaſion why *Candles* run and flear; and after they are thus ſing'd, they are rubb'd again with a Piece of Cloth, to make them ſmooth. Then they are all put upon five or ſix Broaches, more or leſs, according to their Quantity, and each Broach immerg'd once, the *Wicks* being all in a Heap upon each Broach; after which Immerſion the *Wicks* are all parted, one by one, ſmooth'd and ſtraiten'd with the Fingers, and then ſtrung on other Broaches, by ſixteen, if the *Candles* be eight in the Pound; by twelve, if of ſix in the Pound, *&c.* In my Opinion, this firſt dipping contributes

tributes much towards making the *Candles* ſtrait, as well as facilitating the firſt Immerſions, which otherwiſe would be attended with ſome Difficulty, each *Wick* without it being too light to be immerg'd with Eaſe; while, on the contrary, being render'd heavier by the *Tallow* they have gather'd in that firſt Immerſion, that Weight helps towards their Precipitation into the Tallow, and keeping at a due Diſtance from each other: Tho' I do not hear that they uſe that Precaution here in *England*. The *Wicks* being thus diſpos'd upon the *Broaches*, they are hung on a Rack, and then the Workman, ſitting at a due Diſtance from his Mould, takes two *Broaches* at a Time, and holding them equidiſtant, by means of the ſecond and third Fingers of each Hand, which he puts between them, he immerges the *Wicks* two or three Times for their firſt Lay, and holding them ſometimes over the Top of the Veſſel, to let them drain, ſtrikes gently the Ends of the *Candles* againſt the ſaid Top, to make it round, (which Striking is repeated every Time the *Candles* are immerg'd, and till they are quite finiſh'd, which ſaves the Trouble of paſſing them, after they are made, over a flat brazen Plate, heated to a proper Pitch by a Fire underneath, to take off their peak'd Ends, or Bottoms) then he places again the *Broach* on the ſame Rack he has took it from, which, for greater Conveniency, ſhould be plac'd on his right Hand, beginning at the End next to him, and proceeding thus to the farther End, that when he has immerg'd all his *Broaches*, he may come back to the firſt *Broach* he had begun with, and ſo on to the others ſucceſſively, that each *Broach* may have Time to dry before 'tis dipp'd again; which Dipping is to be repeated as often as the Workman judges it proper to bring the *Candles* to the Thickneſs propos'd; with the laſt Dip the *Candles* are naked, *i. e.* plung'd below that Part of the *Wick* where the other Lays ended. During the whole Operation, the *Tallow* is to be ſtirred from Time to Time. Some are ſo nice, as to expoſe the *Candles*, when made, to the open Air, to be whiten'd, eſpecially in the Night-time; which, in my Opinion, muſt communicate a Dampneſs to the *Wick*, and hinder it from burning well: Tho' I have been aſſur'd of the contrary. Thus far for the making of *dipp'd Candles*.

But as we hope our Shop will be a well-accuſtom'd one, which could not be expected unleſs we have it ſtock'd in a Manner as to be in a Condition to oblige all our Cuſtomers, that is, with very good *Candles*, and of all Shapes and Sizes; we'll proceed to the making of *Mould Candles*, the Invention of M. *Le Brez*, at *Paris*; which to perform, we have provided ourſelves with braſs and tin *Moulds*, which are the beſt, which *Moulds* conſiſt of three Pieces, the Neck, Shaft, and Foot. The Shaft is a hollow Cylinder, of the Diameter and Length of the *Candle* propos'd; at the Extremity of this is the Neck, which is a little Cavity, in Form of a Dome, having a Moulding within-ſide, and pierc'd in the Middle with a Hole big enough for the *Wick* to paſs through. At the other Extremity is the Foot, in Form of a little Tunnel, thro' which the liquid *Tallow* runs into the *Mould*. The Neck is ſolder'd to the Shaft, but the Foot is moveable, being apply'd when the *Wick* is to be put in, and taken off again when the *Candle* is cold. A little beneath the Place where the Foot is apply'd to the Shaft, is a kind of String of Metal, which ſerves to ſupport that Part of the *Mould*, and to prevent the Shaft from entering too deep in the Table, to be mention'd hereafter. Laſtly, In the Hook of the Foot is a Leaf of the ſame Metal, ſolder'd within-ſide, which advancing into the Center, ſerves to keep up the *Wick*, which is here hook'd on preciſely in the Middle of the *Mould*.

Having thus deſcribed the *Mould*, and the ſeveral Parts 'tis compos'd of, we'll proceed to the Operation, by introducing, firſt, by a Piece of Wire, the *Wick* into the *Mould*, thro' the Aperture of the Hook, till it comes out at the Neck, to which it muſt be ty'd, ſo that in drawing the Wire back the *Wick* comes along with it, leaving only enough a-top for the Neck; the other End is faſten'd to the Hook, which keeps it perpendicular. Then we'll diſpoſe the *Moulds* in the Table abovemention'd, pierc'd full of Holes, each an Inch in Diameter: Theſe Holes receive the *Moulds* inverted as far as the String in the Foot. Being thus plac'd perpendicularly, we'll fill them with melted *Tallow*, (prepar'd as before) by pouring it into the Foot with a Pot, or Ladle. After the *Moulds* have ſtood long enough to cool, for the *Tallow* to have ariv'd at its Conſiſtence, the *Candle* is taken out, by taking off the Foot, which brings the *Candle* along with it. This Sort of *Candles* are more agreeable to the Sight, light better, and laſt longer than the dipped ones, and coſt but a Trifle more.

The moſt beautiful of all Sorts of *Candles*, which give a finer Light, laſt longer, and have not the offenſive Smell of thoſe made of *Tallow*, are thoſe made of *Wax*; therefore we'll leave off our greaſy blue Frock, and quit our ſtinking Shop, where we have been almoſt ſuffocated with the Fumes of melted *Tallow*, to ſet up the ſame Buſineſs in finer Materials, ſuch as *Wax*; and in our new Shop we'll make *Tapers* for *Churches*, (tho' very ſeldom us'd in ours) *cylindrical Wax Candles* for the Table, Balls, Aſſemblies, *&c. Flambeaux*, &c. But before we proceed on theſe different Operations, we muſt prepare our *Wax* for it; which conſiſts in *bleaching* it. Previouſly to it, we muſt know how to chuſe our *Wax*, which is often ſophiſticated with Roſin, or Pitch, colour'd with *Rocou*, or *Turmerick*; therefore the beſt is that of a *high Colour*, an agreeable Smell, brittle, and which does not ſtick to the *Teeth* when *chew'd*.

This Sort of *Wax* is *bleached*, or whiten'd, by reducing it firſt into little Bits, or Grains, by melting it, and throwing it, while hot, into cold Water; or elſe by ſpreading it into very thin Leaves, or Skins. This *Wax*, thus granulated, or flatted, (tho' 'tis beſt to be granulated) is expos'd to the Air on linnen Cloths ſtretch'd tight on a Frame, rais'd three or four Foot above Ground, and expos'd in an open Place, or Garden, to the moſt powerful Beams of the Sun; the granulated *Wax* ſpreaded thin over it, where it reſts Night and Day, having equal Need of Sun and Dew. Then it muſt be melted, and granulated over again, ſeveral Times, ſtill laying it out to the Air in the Intervals between the Meltings. When the Sun and Dew have at length perfectly *blanched* it, we'll melt it for the laſt Time, in a large Kettle, out of which we'll caſt it with a Ladle upon a Table, cover'd over with round Cavities, of what Bigneſs we pleaſe, to form our *Wax* into Cakes; having firſt wetted thoſe *Moulds* with cold Water, that the *Wax* may be the eaſier got out. Theſe Cakes muſt be laid out to the Air, for two Days, and two Nights, more or leſs, according to their *Thickneſs*, to render it more tranſparent, and drier.

Our *Wax* thus prepar'd, we'll go to work, beginning with *Tapers* for *Churches*, &c. ſince *ab Jove principium*. *Tapers* are of a conical Figure, ſtill diminiſhing from the Bottom, which has a Hole to receive the Hook of the Candleſtick; and are made either with *a Ladle*, or *with the Hand*.

To make *Tapers* with the *Ladle*, the *Wicks* muſt be cut of the proper *Length*, and a Dozen of them ty'd by the Neck, at equal Diſtances, round an iron Circle, ſuſpended directly over a large Baſon of Copper tinn'd, and full of melted *Wax*; then a large *Ladle* full of this *Wax* is pour'd gently, by Inclination, on the Tops of the *Wicks*, one after another; ſo that running down, the whole *Wick* is thus cover'd, the Surplus returning into the Baſon; where it muſt be kept warm, by a Pan of Coals underneath it. We muſt thus continue to pour on the *Wax* till the *Taper* arrives at its deſtin'd Bigneſs; ſtill obſerving, that the three firſt *Ladles* be pour'd on at the Top of the *Wick*, the *4th* at the Height of $\frac{1}{4}$, the *5th* at $\frac{1}{3}$, and the *6th* at $\frac{1}{2}$; by which Means, the *Taper* arrives at its pyramidal Form: Which done, the *Tapers* muſt be taken down hot, and laid a Side of each other in a

Feather-Bed folded in two, to preſerve their Warmth, and keep the *Wax* ſoft; then they are to be taken and roll'd one by one, on an even Table, uſually of Walnut-Tree, with a long ſquare Inſtrument of Box, ſmooth at the Bottom, the Roller having been before moiſten'd with Water, to hinder the *Wax* from ſticking to it. The *Taper* being thus roll'd and ſmooth'd, its biggeſt End is cut off, and a conical Hole made in it with a Peg ſhap'd in that Form, which muſt be alſo moiſten'd with Water, and the *Taper* roll'd all the while the ſaid Peg is thruſting into it, to facilitate its Introduction. While the *Taper* is yet warm, Roſes, and other Figures, are made upon it, with Pincers made of *Box*, and is often adorn'd with gold Leaves. This firſt Manner of making *Tapers*, has been for a conſiderable Time almoſt out of Uſe, by reaſon of its being too tedious, too precarious, and becauſe *Tapers* thus made are very fragile, or eaſily broken, even when expos'd to the leaſt Heat.

Therefore the moſt practis'd Method of making *Tapers* at preſent, is, by the *Hand*; which is done thus: The *Wax* being cut into Pieces, and each Piece weigh'd, according to the intended Weight of each *Taper*; thoſe Pieces are put in hot Water contain'd in a braſs Caldron tinn'd, very narrow and deep, to be ſoften'd; which is not done by the hot Water alone, but the *Wax* muſt be work'd with the *Hands* ſeveral Times in the hot Water, to reduce it to a due Softneſs, that it may be work'd with Eaſe, and without being brittle: We muſt obſerve, likewiſe, that the Water ſhould not be too *hot*; for then it would make the *Wax* run, and ſtick to the *Hands*; but it muſt be of ſuch a moderate Heat, as the Workman may bear his Hands in it to take out the *Wax*; which being brought to a competent Softneſs, the Workman hangs an End of his *Wick* on a Hook fix'd on ſome Place, and at a moderate Height; then takes out a Piece of the *Wax*, which he works for the laſt Time in his *Hands*; then having given it the Shape of a little Channel, fixes it on the *Wick* at that End ty'd to the Hook; then greaſing his Hands with Oil, or Lard, but moſt commonly with Oil, diſpoſes his *Wax*, by little and little, round the *Wick*, beginning with the biggeſt End, and diminiſhing gradually, till he arrives down to the lower End, which is to be the Neck of the *Taper*, and where he cuts its *Wick*; and then carries his *Taper* to the Table to be roll'd, and perforated, as thoſe made with the *Ladle*. It muſt be obſerv'd, that in this Operation of working the *Wax* upon the *Wick*, the *Thumb* and *Index* are only employ'd at firſt, *i. e.* in diſpoſing the *Wax* round the *Wick*; but in working it downwards the *Thumb* and *Index* are left out, and the other three Fingers, *viz.* the middle, *Annularis*, and the little Finger, made Uſe of. The *Wax* being preſs'd all down, between them and the Palm of the Hand, obſerving to preſs it gradually, and in ſuch Manner as to give the *Taper* a pyramidal Form. *Tapers* made in this Manner are ſtronger, and burn a great deal longer, and in *hot Weather* will rather bow than break.

Cylindrical Wax Candles, are either *for the Table*, or *drawn*. The firſt Kind are made of ſeveral Threads of Cotton looſely ſpun, and twiſted together, cover'd with the *Ladle*, and roll'd, as the conical ones, but not pierc'd. *Drawn Wax Candles*, are ſo call'd, becauſe actually drawn, in the Manner of Wire, by Means of two large Rollers, or Cylinders of Wood, turn'd by a Handle; which turning backwards and forwards ſeveral Times, paſs the *Wick* thro' melted *Wax* contain'd in a braſs Baſon, and at the ſame Time thro' the Holes of an Inſtrument like that us'd for drawing Wire, faſten'd at one Side of the Baſon; ſo that by little and little the *Candle* acquires any Bulk, at Pleaſure, according to the different Holes of the Inſtrument thro' which it paſſes. By this Method may four or five hundred Ells Length be drawn running. The Invention of this was brought from *Venice* by *Peter Bleſimare*, of *Paris*, about the Middle of the laſt Century. The *French* call it *Bougie*, and it is very much us'd in the *Roman Catholick* Countries, eſpecially in Monaſteries of both Sexes, and in Cathedral or Collegiate Churches, where the Prebends go early to *Church*, and want each a *Light*, to read or ſign their Office, in their reſpective Stalls; for which Purpoſe they uſe this *Bougie*, made up into Cakes, from two Ounces to a Pound Weight.

FLAMBEAUX are made ſquare, uſually of four *Wicks*, or *Branches*, of an Inch thick, and about three Foot long, made of a coarſe hempen Yarn half twiſted. They are made with the *Ladle*, much the ſame as *Tapers* are, *viz.* by firſt pouring the melted *Wax* on the Tops of the ſeveral ſuſpended *Wicks*, and letting it run down to the Bottom: This is repeated twice. After each *Wick* has thus got its ſeveral Cover of *Wax*, they are laid to dry, then roll'd on a Table, and four of them join'd together by being ſolder'd with a red-hot Iron. When join'd, more *Wax* is pour'd on them, till the *Flambeau* is brought to the Size requir'd, which is uſually a Pound and a Half, or two Pounds. Their Form, or Outſide, is finiſh'd with a Kind of poliſhing Inſtrument of Wood, by running it along all the Angles form'd by the Union of the *Branches*.

The *Flambeaux* of the Antients were made of Wood dry'd in Furnaces, or otherwiſe. They us'd divers Kinds of Wood for this Purpoſe; the moſt uſual was Pine. *Pliny* ſays, that in his Time they frequently alſo burnt Oak, Elm, and Hazel. In the *7th* Book of the *Æneid*, mention is made of a *Flambeau* of Pine; and *Servius* on that Paſſage remarks, that they alſo made them of the Cornel-tree. *Flambeaux* are ſometimes made of *white Wax*, and ſometimes of *yellow*; but thoſe made of *white Wax* are finer, light beſt, and are of a leſs offenſive Smell; tho' in all *Flambeaux*, let them be made of *white*, or *yellow Wax*, both Sorts of *Wax* are always more or leſs ſophiſticated. They ſerve to burn a-Nights in the Streets, as alſo at Funeral Proceſſions, Illuminations, *&c.*

CHAOLOGY.

CHAOLOGY, is the fabulous Hiſtory, or Deſcription of the *Chaos*, which all the antient Sophiſts, Philoſophers, Naturaliſts, Poets, Divines, *&c.* have always repreſented as the firſt Principle of the World, and which they deſcrib'd as a dark turbulent Kind of *Atmoſphere*; or a diſorderly Syſtem, or Mixture of all Sorts of Particles together, without any Form or Regularity, out of which the World was form'd.

I define *Chaology* a fabulous Hiſtory, ſince I can ſee nothing in it but what's repugnant to Senſe and Reaſon; much more to that grand Idea we ſhould form to ourſelves of the unlimited Power of the divine Creator of all Things, who, by the ſole Efficacy of his eternal Word, could form the World of nothing, as perfect at firſt, as the learned Dr. *Burnet* is pleas'd to repreſent it in his *Chaology*, after the Separation of the homogeneous Particles from thoſe of a contrary Principle; and their Diviſion afterwards into Regions, for the Formation of a ſolid habitable Globe.

I would aſk thoſe eminent Divines who entertain us with the Romance of that entire, undivided, and univerſally rude and deform'd Maſs they call *Chaos*, or TOHU BOHU, if that Maſs was *ab æterno*, or had a Beginning? If it was *ab æterno*, *i. e.* of all Eternity, then

then the World was of all Eternity; and therefore what *Moſes* ſays of it muſt be a Fable, or an Impoſture. But, ſays Dr. *Burnet*, tho' this rude and deform'd Maſs had been *ab æterno*, it could not be concluded hence that the World is *ab æterno*, becauſe that Maſs had no Solidity, Order, or Arrangement in its Parts, but was only a confus'd *certum quid*, of no Uſe, and appropriated to nothing; ſo that if it had been left in its original Deformity, it would never have deſerv'd that Appellation *World*, ſince it had never been that ſolid Maſs, divided into ſo many different Regions, and of ſo many different Poſitions, as to become at laſt an habitable Globe. Therefore as the World begun but then, it cannot be eternal.

To this I reply, that tho' the World could not be ſaid to have exiſted then in the ſame Manner it has done ever ſince that pretended Exploſion, Separation, and Arrangement of the ſeveral different Matters, folded up in the *Chaos*; it cannot be ſaid but it exiſted then eſſentially, and actually, and of a far more perfect Exiſtence than the ſeveral Parts of a *Fœtus* exiſts in the *Embryo*; ſince in this thoſe Parts cannot be brought to Perfection without Nutrition, which is an Increaſe, and a new Acquiſition of Matter; but in that (even in our *Chaologian*'s Opinion) there was in the *Chaos* a Quantity of Matter ſufficient for the Compoſition of the ſeveral Parts of the World, which Matter wanted nothing elſe but a due Conſiſtence. Nay, that Matter was even ſo perfect as to be capable to direct itſelf to Action, for (ſay again our *Chaologians*) the *homogeneous Particles ſeparated themſelves from thoſe of a contrary Principle*, each contributing its Mite towards the Formation of the Globe, and each directing itſelf to its natural Situation. But I would aſk thoſe Gentlemen how that Separation happen'd, and what could be the Cauſe thereof? For if that Maſs was eternal, and conſequently had that Virtue inherent in itſelf to unfold its Principles in ſo beautiful a Manner as to form at any Time that excellent Piece of *Mechaniſm*; what could be the Reaſon why ſo admirable a Faculty was kept ſo long idle and inefficacious? Is it becauſe the different Principles that rude and confus'd Maſs was compos'd of could not be brought, till then, to Maturity? If ſo, that Maſs was not perfect, and being not perfect, could not be eternal; ſince we cannot form to ourſelves the Idea of an eternal Being, without, at the ſame Time, repreſenting it to our Imagination entirely perfect.

But, ſay they, we don't pretend that the *Chaos* had been eternal; on the contrary, we believe that it had a Beginning, as well as all the other created Beings. Let it be ſo, that it had a Beginning; the ſame Difficulty ſtill remains: For I would aſk them when that *Chaos* was created, and to what Purpoſe? As to the Time of its Creation, no Authors, not even the *Chaologians* themſelves, have been pleas'd to inform us of it: For *Moſes*, who has wrote the Hiſtory of the Creation, informs us no further than that *In Principio Deus creavit Cœlum & Terram*; In the Beginning God created Heaven and Earth: But don't make the leaſt mention that he extracted that Heaven and Earth from a *Chaos*. Beſides, the Word *created* is a Negation of any created Being pre-exiſtent to it; of which that Heaven and Earth could have been form'd. But to what Purpoſe could God have created that monſtrous Heap of Matter, previouſly to the Formation of Heaven and Earth? To have a Subject to work upon? Is not a Suppoſition of that Nature injurious to his infinite Wiſdom, and omnipotent and unlimited Power? Beſides, could it be reaſonably ſuppos'd that the ſame Being who could have created that unform'd Maſs of nothing, for the Formation of the World, could not have as well form'd the World itſelf of nothing, as of that unform'd Maſs? Can there be any Interval ſuppos'd between his efficacious Will, and his Action; or are not rather both Operations inſeparable in a ſupreme Being? And could not the ſame *fiat* which is ſuppos'd to have extracted the *Chaos* from nothing, have as well extracted the World in its full Perfection from nothing? Since that *Chaos* could have been nothing elſe but a Subject for *God* to work upon. But why ſhould he not have created that Subject as perfect at firſt, as he would have it afterwards? Is it becauſe he would not, or could not? If he would not, he muſt have had ſome juſt Reaſon for it, conducive towards the Advancement of his Glory, or relating to the juſt Symmetry of the different Parts that *great Whole* was to be compos'd of; but could his omnipotent Power have been better manifeſted, by the Formation of the World from an unform'd *Maſs*, than by its having been created perfect at once? If he could not, then his Power was limited, and not infinite; which cannot be ſaid of *God*'s Power, without Blaſphemy.

But what was that pretended *Chaos*? Mr. *Whiſton* ſays, that it was the Atmoſphere of a Comet; ſo that he will have the Exiſtence of Comets to have preceded the Formation of all other created Beings, ſince the Exiſtence of a *Comet* muſt be ſuppos'd previouſly to that of its *Atmoſphere*. Therefore the moſt imperfect in all Appearance, of all created Beings, muſt have preceded the Creation of the moſt perfect ones. That a *Comet* is one of the moſt imperfect, in its Kind, of all other created Beings, evidently appears, by its Inſtability, and the Irregularity of its Motion; nay, a *Comet* is not only one of the moſt imperfect, but, in ſome Meaſure, a needleſs Being; ſince the greateſt Aſtronomers have not been capable, yet, to diſcover for what Uſe, and to what Deſign *Comets* are plac'd in the Heavens; ſince neither the ſuperior or inferior World ſeem affected by their Appearance or Abſence; and far from contributing towards the juſt Harmony which ſubſiſts between the different Parts of both, it rather ſeems, when they appear, as if they were ſomething foreign to the whole Mechaniſm, and ſome Pieces out of Place, ſo contrary to Nature itſelf, that it conſiders them as ſomething ſtrange and ominous. What Appearance, then, that God would have made a *Comet* his *Coup d'eſſay*, or his firſt Piece of Work.

But if it was ever ſo true that the Atmoſphere of a *Comet* was what has been call'd *Chaos*; I would aſk Mr. *Whiſton* where was that firſt *Comet* plac'd, ſince of its Atmoſphere the Heavens and Earth were form'd, which ſuppoſes no pre-exiſtent created Being, but that *Comet* with its Atmoſphere, ſince Mr. *Whiſton* will have it ſo; perhaps *God* forming that *Comet*, had alſo form'd a Heaven for its Reſidence; or we might ſuppoſe that it fill'd up that immenſe Vacuity which afterwards was divided between the ſuperior and inferior World, which would be a falſe Suppoſition; ſince by ſuppoſing that Vacuity, it would be ſuppoſing ſtill a created Being pre-exiſting the World, which would deſtroy the whole Syſtem of the Creation; ſince that immenſe Space fill'd by the Heavens and Earth had no Exiſtence independent from them, but was created occaſionally, and at the ſame Time with the Bodies it was to be fill'd with. Beſides, the Suppoſition of ſuch *Comet* is a manifeſt Contradiction of what *Moſes* is pleas'd to relate of the Creation of the World, when he ſays, that at the Beginning, *i. e.* previouſly to any Thing elſe, God created the Heaven and Earth. But we'll ſuppoſe, for a Moment, with Mr. *Whiſton*, that there was ſuch a *Comet* pre-exiſtent to the Creation of the World; what could have been its Subſtance? Was it ſolid, like the other *Comets* which have appear'd ſince? For if it was, what better Subject could the Creator have choſe for to work upon, than the *Comet* itſelf, which had ſo well anſwer'd all his Intentions, without having Recourſe to its Atmoſphere, which could not be form'd without the Concurrence of ſome of the other heavenly Bodies; eſpecially the *Sun*, which had no actual Exiſtence then, ſince, like the other Parts of the World, it was to be form'd of that *Atmoſphere*, which Mr. *Whiſton* ſuppoſes to have been what the *Chaologians*, both antient and modern, call'd *Chaos*.

Orpheus was the firſt Inventor of that Romance, and ſets forth in his *Chaology* the different Forms that *Chaos* went thro' till it became inhabitable. *Heſiod*, *Menander*, *Ariſtophanes*, *Euripides*, and the Writers

of the Cyclick Poems, repeat the ſame Fable; and the *Barbarians*, *Phœnicians*, *Egyptians*, *Perſians*, &c. build the World upon it.

The *Stoicks* are of Opinion, that as the World was firſt made of a *Chaos*, it ſhall at laſt be reduc'd to a *Chaos*; and that all its Periods and Revolutions, in the mean time, are only Tranſitions from one *Chaos* to another. *Ennius*, *Varro*, *Ovid*, *Lucretius*, *Statius*, &c. are all of the ſame Opinion, which aroſe firſt among the *Barbarians*, whence it ſpread to the *Greeks*, and from the *Greeks* to the *Romans* and other Nations. Dr. *Burnet* obſerves, that beſides *Ariſtotle*, and a few other *Pſeudo-Pythagoreans*, no Body ever aſſerted that our World was always from Eternity of the ſame Nature, Form, and Structure, as at preſent; but that it had been the ſtanding Opinion of the wiſe Men of all Ages, that what we now call the terreſtrial Globe, was originally an unform'd, indigeſted Maſs of heterogeneous Matter, call'd *Chaos*, and no more than the Rudiments and Materials of the preſent World.

For my Part, I am none of thoſe wiſe Men of Dr. *Burnet*; for admitting the Truth of the Hiſtory of the Creation, as related by *Moſes*, I cannot perſuade my ſelf that God, againſt whoſe infinite Wiſdom it is to create any Thing imperfect in its Kind, can be juſtly ſuppos'd to have created that rude, unform'd, and indigeſted Maſs call'd *Chaos*, for the Formation of the World; ſince, as I have already obſerv'd, no good Reaſon can be aſſign'd for it; and that it is more agreeable to human Underſtanding to believe, that he who could extract that indigeſted Maſs from nothing on Purpoſe to form of it afterwards a digeſted one, could equally extract from nothing the ſame Maſs already digeſted: That we have all the Reaſon imaginable to believe he did this, when we know nothing of that but by mere Conjecture, and on the Report of ſome Poets and Hiſtorians, whoſe chief Talent was to entertain their Readers with Fables and Romances. Tho' ſeveral Authors are of Opinion, that theſe antient Poets, Philoſophers, *&c.* might have deriv'd their *Chaos*, with ſome Alteration and Interpolation, from *Moſes*, who, ſay they, derives the Origin of his World from a Confuſion of Matter, dark, void, deep, without Form, which he calls *Tohu Bohu*; to which they add, that *Moſes* goes no farther than the *Chaos*, nor tells us whence it took its Origin, or whence its confus'd State; and that where *Moſes* ſtops, there, preciſely, do all the reſt. Tho', for my own Part, I do not find, in all *Moſes*'s Writings, the leaſt mention of that *indigeſted Maſs* of which the *Chaologians* pretend the World was form'd. Therefore it is not ſurprizing, if he takes no Notice of the Origin of a Thing he had not the leaſt Notion of. *Moſes* had two great an Idea of the Wiſdom and Omnipotence of God, to make him follow the ſame Method in his divine Operations we do in ours; and no doubt that if it had been his Sentiment that God, the ſupreme Being, had form'd the World of the *Chaos*, he had inform'd us of it in as clear and particular Terms as he does when he ſays, that *In the Beginning God created the Heaven and the Earth*, Gen. i. 1.

CHIRURGERY.

CHIRURGERY, (from the *Greek* χειρ, *manus*, Hand; and εργον, *opus*, Operation;) is an Art which teaches how to cure the Maladies of the human Body, by a methodical Application of the Hand, and of Remedies.

Chirurgery is divided into *ſpeculative* and *practical*, one whereof does that in Effect, which the other teaches to do; for without the Theory, a *Chirurgeon* cannot be ſecure of what he does; neither can he acquire the Dexterity of Hand ſo abſolutely neceſſary to his Profeſſion, without Experience and Labour, which we call the *Practical Chirurgery*.

All the Operations of *Chirurgery* are reduc'd under four Kinds; the *Syntheſis*, *Diæreſis*, *Exæreſis*, and *Protheſis*.

The SYNTHESIS, is that which reunites all the divided Parts, as are the Wounds.

The DIÆRESIS, is that which divides and ſeparates the Parts, whoſe Union hinders the Cure of Maladies, as is the Continuity of the Skin, and of the Fleſh in Abſceſſes, which muſt be open'd to procure the Evacuation of the *Pus* contain'd therein.

The EXÆRESIS, is that which extracts from the Body all which could be hurtful to it, as Bullets, Arrows, *Pus*, *&c.*

The PROTHESIS, is that which ſupplies, artificially, the Want of ſome Parts, as of Legs, Arms, *&c.* when the natural ones are loſt. It adds, beſides, ſome Inſtrument, to help the weak Parts; as Peſſaries, to keep the *Matrix* in its Place, when it falls; Crutches, to help Walking, when a Perſon is weak, *&c.*

Four Things are to be conſider'd before an Operation can be attempted: The firſt, which is the Operation to be made; the ſecond, why it is made; the third, if it be neceſſary, or poſſible; and the fourth, in what Manner 'tis to be made.

The Operation to be made is known by its Definition, *i. e.* by explaining what it is in itſelf. We'll know if the Operation is to be made, by examining if the Malady can't be cur'd without it. We'll judge if it be poſſible, or neceſſary, in knowing the Malady, the Strength of the Patient, and the Part affected. And, laſtly, we'll know how to make it, if we have well exercis'd ourſelves in the Practice of *Chirurgery*; for there is no greater Barbarity, than to attempt thoſe Operations without Skill: For the Patient is not only thereby butcher'd, but likewiſe put to the moſt imminent Danger of loſing his Life in the moſt excruciating Torments. I tremble for the Lives of thoſe unhappy Sailors committed to the Care, or rather murdering Hands of young Fellows, who, without the leaſt Experience, or other Merit, but that of a great *Apparatus* of *chirurgical Inſtruments*, without ſo much as knowing their different Names, far from having the leaſt Notion how to uſe them, ſhip themſelves on board a Ship, even in Time of War, in Quality of *Chirurgeon*; are not the Approaches of ſuch an ignorant Wretch more to be fear'd than thoſe of the Enemies? And ſhould they not be puniſh'd, together with thoſe who promote them to thoſe Poſts, the one as Murderers, and the other as acceſſory to it? Can it be poſſible to imagine that the Legiſlature would ſuffer the Lives of his Majeſty's Subjects, on which depends, in Part, the Security of the Kingdom, to be thus trifled with, if they were appriz'd of it? For my Part, I know ſome of thoſe pretended *Chirurgeons*, who have here taken on board *Engliſh* Privateers, during this War with *Spain*, becauſe the Maſter of the Veſſel could have them for very near Half the Price he had been oblig'd to give to a true *Chirurgeon*; but I ſuppoſe thoſe Maſters had no Deſign to fight, elſe they had taken greater Care to provide a better one.

The Foundation of *Chirurgery* conſiſts in three Things, *viz.* in the Knowledge of the human Body; of the Maladies which want the Operation of Hands; and of the proper Remedies.

The Knowledge of the human Body is acquir'd by the Study of Anatomy, of which we have a compleat Treatiſe under the Letter *A*. That of the Maladies, 1. By reading good Books, and the Leſſons of the beſt

beſt Maſters in *Chirurgery*; and, 2. By a conſtant and aſſiduous Practice.

The Maladies which are the Object of *Chirurgery*, and fall under the Conſideration of a *Chirurgeon*, are Tumours, Impoſthumes, Wounds, Ulcers, Fractures, Diſlocations, and generally all Maladies which can be the Subjects of Operations.

The Means and Inſtruments us'd in *Chirurgery*, to cure thoſe Maladies, are five in Number, *viz.* the Hand, Bandages, Medicaments, Iron, and Fire. For *Hippocrates* teaches us, that when Medicaments are not ſufficient, Iron muſt be employ'd, and afterwards Fire; meaning thereby, that a *Chirurgeon* ought to proceed gradually.

The Inſtruments us'd in *Chirurgery* are either *portative*, and *non-portative*, (for tho' we may be ſufficiently learned and experienced, we muſt alſo provide ourſelves with all that's neceſſary, and uſeful to our Profeſſion, *viz.* Inſtruments, Plaiſters, Unguentums, *&c.*

The *portative Inſtruments* are thoſe which a *Chirurgeon* carries in his Caſe in his Pocket, together with his Box of *Unguentums*, (which the *French* call *Boitier*) as a good Pair of Sciſſars, a Razor, a *Biſtouri*, ſtrait and bow'd, a *Spatula*, a great *Lancet* for the Abſceſs, ſmaller ones for Bleeding, a *hollow Probe*, of Silver or Steel, ſeveral other *Probes*, ſtrait, bow'd, *&c.* of ſeveral Bigneſſes; a ſilver *Canule*, or Pipe, to carry the Button, or Knob of Fire to a diſtant Part without any Danger of burning the neighbouring ones; another *Canule*, or Pipe, for a Caſe for Needles, made like a Whiſtle at one End, for the *Sutures*; a big triangular Needle, call'd *Carlet*, a *Myrtle-leaf*, a *ſmall File*, Inſtruments for Tooth-drawing, a Lenticulary, an *Errhina*, &c.

The Inſtruments *non-portative*, are either particular to certain Maladies, or common to all. Inſtruments deſign'd for particular Operations, are the *Trepan*, to open the Bones of the Head, or other Parts; the *Algabus*, or *Probus*, for Men and Women in the Stone, and Difficulties of Urine; large bow'd cutting Knives, a Saw for Amputations, great three-ſquare Needles for *Setons*, ſmall Needles for the Ablation of the Cataract, ſmall Plates and Buckles, for the Reunion of the *Bec de Lievre*.

From the Inſtruments, we'll proceed to *Compreſſes*, *Bands*, *Splinters*, *Fanons*, *Tents*, and *Lint*.

A *Band* is a long and large String, wherein the Parts and *Apparatus* are wrapp'd up, and contain'd. The *Bands* at preſent are made of Linnen; in *Hippocrates*'s Time they were made of Leather, and woollen Stuff. There are two Sorts of *Bands*, viz. *ſimple*, and *compos'd*; the *ſimple* are all of a Piece, and have only two Ends; and the *compos'd* are garniſh'd with Wool, Cotton, and the like. They are made with ſeveral Chiefs, *i. e.* with ſeveral Ends join'd, or cut in ſeveral Places, as Occaſion requires. The *Bands* muſt be made of clean Linnen half worn, without Hems or Selvage. The *Bands* have different Names, from their different Figures; for they are either long, narrow, triangular, or with ſeveral *Chiefs*, or garniſh'd.

A BANDAGE is the *Band* apply'd on the Part. There are as many different Sorts of *Bandages*, as there are Parts to be ty'd; therefore they are either *ſimple* or *compos'd*. The *ſimple* are thoſe made with an uniform *Band*; the *compos'd* are thoſe made with ſeveral *Bands* plac'd over one another, or few'd together, or with ſeveral *Chiefs*. They have other particular Names from their Authors, or Effects; as *repulſive Bandages*, to repulſe; *attractive*, to attract; *contentive*, to contain; *diviſive*, to keep aſunder; *agglutinative*, to join, *&c.* There are others which have particular Names, and are deſign'd for certain Things; as the *Chevetres*, for the inferior Jaw-bone; the *Frondes*, for the Chine, Shoulder, and the *Pireneum*; the Scapularies for the Body, the Brayers for Ruptures, the *Champignons* for the *Scrotum*, the Stirrups for bleeding of the Foot, and other Occaſions.

There are ſeveral Conditions to be obſerv'd in *Bandages*: 1. Care muſt be taken that the *Bands* ſhould be roll'd tight, tho' neither too tight, nor too looſe. 2. In Fractures, they muſt be undone from Time to Time; and they muſt be rais'd every third or fourth Day, to ſtrengthen them. 3. They muſt be roll'd commodiouſly, that they may not hurt the Patient.

The COMPRESSES muſt be made even, ſoft, and in Proportion to the Bigneſs of the Part, or of the Wound. They muſt be garniſh'd in uneven Places, that the Bandages may be the eaſier roll'd over them, and humected with ſome Liquor proper to the Malady.

Having thus provided ourſelves with all that pertains to our Profeſſion, to operate with Art and Safety; we'll paſs to the *Examen* of the ſeveral different Maladies which fall under the Inſpection of a *Chirurgeon*; taking Care to inform ourſelves of the beſt Method to be obſerv'd in the different Progreſs of the Cure. We'll begin by the *Tumours* in general.

A TUMOR, or *Tumour*, is a particular Riſing, or Eminence, on any Part of the Body; otherwiſe, it is a Solution of Continuity, ariſing from ſome Humour collected in a certain Part of the Body, which diſjoins the continuous Parts, inſinuates itſelf between them, and deſtroys their proper Form.

This gathering of Humours in the Parts of the Body, is call'd *Depoſitum*, which *Depoſitum* is made either by *Fluxion*, or *Congeſtion*.

A *Depoſitum* by *Fluxion*, is that which forms the *Tumour* all on a ſudden, or in a very ſhort Time, by the Fluidity of the Matter. And a *Depoſitum* by *Congeſtion*, is that which produces the *Tumour* by Degrees, and almoſt inſenſibly, thro' the Slowneſs and Thickneſs of the Matter.

The moſt dangerous of all *Tumours*, are thoſe made by *Congeſtion*; becauſe their coarſe and thick Matter renders their Cure very difficult.

The Difference of *Tumours* proceed, 1. From the natural Humours they are fill'd with; which Humours are either ſimple, mix'd, or alterated. Simple, as the *Phlegmon*, which is fill'd with Blood; and the *Eriſipela's*, fill'd with Bile; mix'd, as the *eriſipelatous Phlegmon*, fill'd with Blood mix'd with Bile; or the *phlegmonous Eriſipela*, fill'd with Bile mix'd with a Portion of Blood; alterated, as the *Meliceris* fill'd with ſeveral Humours which can't be diſtinguiſh'd, becauſe of their too great Alteration or Change. 2. The Difference of the Tumours is taken from their Likeneſs. 3. From the Parts on which they are ſituated; as the *Ophthalmia* in the Eye, *Parotis* about the Ears, *Paronchia* in the Fingers, *&c.* 4. From the Malady which cauſes them; as the venereal and peſtilential *Buboes*. 5. From certain Things found in one, and not in the others; as in *enkiſted Tumours*, which have their Matter contain'd in a *Cyſtis*, or Bags; and thus of ſeveral others.

There are four Kinds of Tumours which include at once all the particular Species, *viz.* the *natural Tumours*, the *ankiſted*, the *critical*, and the *malignant*.

Natural Tumours, are thoſe form'd of one of the four Humours contain'd in the Maſs of Blood, or of ſeveral mix'd together; which four Humours are, the *Blood*, *Bile*, *Pituita*, and *Melancholy*; which produce each their particular Tumour, *v. gr.* the *Blood* produces the *Phlegmon*; the *Bile* the *Eriſipela*; the *Pituita* the *Œdema's*; the *Melancholy* the *Scirrhus*; and their Mixture produces, again, the *eriſipelatous Phlegmon*, the *œdematous Phlegmon*, or *phlegmonous Eriſipela*, the *phlegmonous Œdema*, and according to the Quality of the predominant Humour, the *Tumour* is call'd by its Name.

Ankiſted Tumours, are thoſe whoſe Matter is contain'd in a *Cyſtis*, or membranous Bag; as the *Meliceris*, or *King's Evil*.

Critical Tumours, are thoſe which appear all on a ſudden, in great Maladies, and terminate them for the Good, or the Diſadvantage of the Patient; as the *Parotides*.

Malignant Tumours, are thoſe always found accompanied with extraordinary and dangerous Symptoms, and whoſe Conſequences are alſo very dangerous.

The *Apoſthume*, *Abſceſs*, *Exitures*, and *Puſtules*, are Species of *Tumours*, which differ among themſelves but *from more to leſs*; tho', properly ſpeaking, by the Names *Apoſthumes* and *Abſceſs*, are underſtood big *Tumours* to be brought to Suppuration; and by thoſe of *Exitures* and *Puſtules*, are meant ſmall *Tumours* which appear in great Numbers, and which are very ſeldom brought to Suppuration; the one being form'd of very few Humours, and the others containing a dry Matter.

But, however, there is this Difference between *Tumour* and *Apoſthume*, or *Abſceſs*, that all *Tumours* are not *Apoſthumes*, nor *Abſceſs*, tho' all *Apoſthumes* and *Abſceſſes* are *Tumours*. For Example, the *Gangelions* are *Tumours*, tho' they are not *Abſceſſes* nor *Apoſthumes*; while, on the contrary, *Abſceſſes* and *Apoſthumes* are always *Tumours*; becauſe they cauſe a Riſing, and an Elevation on the Part.

M. *Littre* is of Opinion, that there are windy *Tumours* form'd of Air, incloſ'd under ſome Membrane, which it dilates more or leſs, in Proportion to the Quantity, and from which it cannot eſcape, at leaſt not for ſome Time. The Difficulty is, to conceive how the Air ſhould come to be collected here. M. *Littre* thinks, that the moſt ordinary Cauſe of *windy Tumours* is the gathering of Juices in ſome neighbouring Part wherein there is an Obſtruction. The Air, which is intimately mix'd with all the Juices of the Body, continues to be ſo while they are in their natural Fluidity and Motion; but if they are collected in any Part, and by Conſequence have their Motion and Fluidity diminiſh'd, the Air gets its Liberty, and diſengages itſelf from them. Now the Membranes of the Part wherein the Liquor is collected becoming dilated by this Collection, and their Pores enlarg'd, the diſengag'd Air eſcapes thro' them, but the Juice is left behind, as being too much thicken'd by its Stay there: It therefore runs under ſome other neighbouring Membrane, which it raiſes, ſwells, and extends.

From this Deſcription of the different Kinds of *Tumours*, we'll paſs to the Cure, giving all the neceſſary Inſtructions, general as well as particular, to bring it to Perfection, not only for all *Tumours* in general, but likewiſe for each different *Tumour* in particular.

The general Rules which a *Chirurgeon* is indiſpenſibly oblig'd to obſerve before he undertakes the Cure of *Tumours*, are theſe: 1. He muſt examine the Nature of the *Tumour*, becauſe that which is natural, is otherwiſe treated than that which is *ankiſted*, critical, or malignant. 2. The Time of its Formation, *i. e.* its Beginning, Increaſe, State, and Declenſion; in which different Periods there muſt be apply'd different Remedies. And, 3. Its Situation, that the *Chirurgeon* may avoid, in the opening of the *Tumour*, the Encounter of a neighbouring Artery or Tendon.

We muſt obſerve, alſo, that all *Tumours* terminate, or are remov'd by Suppuration, or Reſolution; the two other Manners admitted by *Chirurgeons* being not ſo ſafe, *viz.* by *Induration* and *Putrefaction*; ſince a *Tumour* cannot be ſaid to be perfectly cur'd, while ſome Relicks of it remains, as it happens in the *Induration*, where the Matter is indurated by an imperfect Reſolution; or when the *Tumour* is degenerated into another Evil, as in *Putrefaction*, which is often ſucceeded by the Gangrene. Therefore the ſafeſt Manner to cure a *Tumour*, is by Reſolution, except when the *Tumours*, or *Abſceſſes*, are critical and malignant; for then the Suppuration is not only the ſureſt Way, but muſt even be procur'd by all Sorts of Means, even by opening it; which muſt be done on that Occaſion without waiting for a perfect Maturity. In ſuch Opening, the *Chirurgeon* muſt take a great deal of Care not to cut the Fibres of the Muſcles, and ought not to procure an entire Evacuation of the *Pus* at once, eſpecially in great *Abſceſſes*, for fear the Patient ſhould faint away; neither is ſuch Opening to be made, always, longitudinally, or according to the Straitneſs of the Fibres; for when the *Tumours* are large, and there is a *Cyſtis*, the Inciſion muſt be *crucial*, or made croſs-wiſe.

There are four Sorts of Matter evacuated in the *Suppuration* of *Tumours*, *viz.* 1. The *Pus*, which is a white thick Matter. 2. The *Dirt*, which is a Matter as thick as the *Pus*, but of ſeveral Colours. 3. The *Sanies*, which is a watery Matter. And, 4. The *Virus*, which is alſo a watery Matter, but whitiſh, yellowiſh, and greeniſh, all at the ſame Time, and comes out of Ulcers, very ſtinking, and with corroſive and malignant Qualities.

A prudent *Chirurgeon* muſt alſo mind, when he undertakes the Cure of *Tumours*, the general Cauſes of thoſe *Tumours*, which are three in Number, *viz.* the *primitive*, which is that which has occaſion'd the *Tumour*, *v. gr.* a Fall, or a Blow receiv'd. The antecedent, which is that which furniſhes Matter to the *Tumour*, as the Maſs of the Blood, which increaſes and entertains the *Phlegmon*. And the *Conjoined*, which is the Blood, or the Matter extravaſated, which forms immediately the *Tumour*, or the *Phlegmon*.

It cannot be otherwiſe remedied to the primitive Cauſe, but by avoiding Falls, Blows, *&c.* The antecedent is remedied by diminiſhing the Plenitude of the Blood, and cooling the whole Maſs by Bleeding. The *conjoint Cauſe* is carried off in diſſipating, by *Reſolution*, the extravaſated Blood, or evacuating it by *Suppuration*.

Critical Tumours borrow their Name from *Criſis*, which is a ſudden *Depoſitum* of Humours made in Maladies, and which ordinarily decides them. This *Depoſitum* is made by the Strength of Nature, which expels thoſe *Tumours* thro' the common Ways for the Evacuation of the Excrements, or carries them to the Circumference. Thro' the common Ways it procures the humoural Flux, the Evacuation of Urine, and the bloody Flux; and by carrying them to the Circumference, or Habit of the Body, it produces Sweats, *Tumours*, and the Gangrene it ſelf.

Thus far for the general Rules to be obſerv'd in the Cure of *Tumours*; at preſent, we muſt enter into a more particular and exact Detail, and conſider, with Attention, how a prudent and experienc'd *Chirurgeon* ſhould proceed in the Cure of each Kind of *Tumour*; beginning with the *Phlegmon*.

The PHLEGMON, from the *Greek* φλεγω, to burn, or inflame; is a Tumour attended with Redneſs, Tenſion, Renitency, Pulſation, and great Pain; which when occaſion'd by an extravaſated Blood, good and laudable, but only peccant in Quantity, is call'd *true Phlegmon*; but if that Blood be adulterated with Bile, or *Pituita*, it is call'd *baſtard Phlegmon*.

Note, That the *Anevriſms* and *Varices*, tho' form'd of Blood, are not *Phlegmons*; becauſe that Blood is not extravaſated, nor accompanied with Inflammation, but forms thoſe Tumours by a too great Dilatation of the Arteries and Veins. Neither are the *Ecbymoſes*, or Contuſions, tho' an extravaſated Blood, to be conſider'd as *Phlegmons*, ſince it does not ſuffice to form the *Phlegmon*, that the Blood ſhould be extravaſated only, but it muſt be attended, likewiſe, with Heat, Pulſation, Inflammation, and Pain; which is not found in the *Ecbymoſes*, the great ones excepted, after they have been neglected, in which the Evacuation of the extravaſated Blood muſt be procur'd firſt, to hinder a too great Suppuration, Inflammation, and ſeveral other dangerous Conſequences.

There are two Sorts of Remedies proper for the Cure of *Phlegmons*, the one general, and the other particular. The general Remedies, which carry off the antecedent Cauſe, are Bleeding, and an exact Diet. Purgatives cure ſometimes the *Phlegmon* in its *antecedent Cauſe*, by diminiſhing the Plenitude, Heat, and Alteration of the Blood. Fomentations, Ca-

Cataplasms and Plaisters, cure it in its *Conjoint Cause*, by procuring the Resolution, or Suppuration; all which different Remedies ought to be administred in Order, and with Judgment, *v. g.* Bleeding is to be done in the Beginning and Augmentation, or Increase of the *Phlegmon*. The Resolutive and Anodyne Remedies are necessary, such as those prepared with *Cherveil* boiled in Whey, to which is to be added some Saffron, to wash the Tumour with, which must be wapt in Cloths dipped in the same Liquor. The Sperm of Frogs alone, or Lime and Soap Water mixed together; or else Oak and Plantine Leaves bruised and applied on the Part, are also very good Remedies for the *Phlegmon*; avoiding above all things cold Remedies, Oil, and Grease, which are pernicious in great Inflammations. These are the Remedies by which we must begin the Cure.

But in the Augmention of the Tumour, and of the Pain, it must be softened by Resolution; and for that Purpose a Cataplasm is composed with Leaves of Elder, with Mallows, Chamomil, and Melilot, to which is added pounded Linseed, boiling the Whole in Whey, adding to a Pound of it the Yolk of an Egg, twenty Grains of Saffron, a Quarter of a Pound of Honey, and Crumbs of Bread, till it has acquired a due Consistence for a Cataplasm, which must be renewed every twelve Hours at least.

When the *Phlegmon* is arrived at its Height, if it could not be brought to a Resolution, its Suppuration might be procured, by adding to the aforesaid Cataplasm, Garlick, the Roots of white Lillies broiled under the Embers, Whey and Basilicon: Or else we'll take only a Glass of Whey, in which we'll melt an Ounce of Soap, to dip Cloth in it, which we'll apply on the Tumour, reiterating it often. The Plaister *Diasulphuris* is very excellent alone.

When the Malignity is conquered, and the *Phlegmon* is on its Declension, the Ulcer must be dried by Degrees with the Plaister *Diasulphuris*, or the *Diachylon*, afterwards we'll use those of *Ceruse*.

Note. That if during the Inflammation, the Gangrene should happen, there must be dissolved in an Ounce of the best Vinegar, a Drachm of white Vitriol, with the same Quantity of *Salarmoniac*, to bathe the Tumour with, or else we'll take the Tincture of Myrrhe, and of Aloes, with some Ægyptiac, and we'll make afterwards a Digestive with Terebinth, Yolks of Eggs, and Honey, mixing with it some Spirits of Wine, or Brandy, if any purulent Matter was left behind.

These are the Remedies to be used in the different Periods of a true *Phlegmon*; but as we have also mentioned a Bastard *Phlegmon*, which must also be cured, we must see how we are to proceed in that Cure, which cannot be done without knowing first, which are the Tumours called properly *Bastard Phlegmons*.

Bastard Phlegmons, otherwise *Phlegmonous Tumours*, are *Buboes*, *Carbuncles*, *Furuncles*, *Antrax*, *Phigeton*, *Phyma*, the *Panaris*, *Gangrene*, *Childblains*, &c.

The *Bubo* is a Tumour which happens in the Groin, accompanied with Heat, Pain, Hardness, and sometimes with Fever. The *Carbuncle* is a hard, red, and burning Tumour, always accompanied with Fever; 'tis covered with a black Crust, which falls afterwards with the Suppuration, and leaves behind a deep and troublesome Ulcer, which does not suppurate at all. The *Antrax* is very little different from the *Carubncle*, appears only in the glandulous Parts, and the *Carbuncle* every where else. The *Furuncle* is a Sort of moderate *Carbuncle*, which resembles the Head of a Nail, and causes the same Pains which could be caused by a Nail being driven into the Part. The *Phigeton* is a small, red, and inflamous Extuberancy, situated on the *Milliary Glands* of the Skin, where it causes a sharp Pain without Suppuration. The *Phyma* appear in the same Manner as the *Phigeton*, and suppurates.

All these Tumours are treated in the same Manner, none of them having any Remedies peculiar to itself, but are all to be cured with emollient, resolutive, and suppurative Cataplasms and Plaisters, which must be applied with Judgment, and in Proportion, as 'tis done to the *Phlegmons*.

The same cannot be said of the *Gangrene*, which is far more dangerous, and therefore wants a greater Care and Attention. The *Gangrene* is distinguished into *Gangrene* and *Sphacelus*, though they be but one and the same Thing; the *Gangrene* being a Mortification begun, while yet the Part retains some Sense of Pain, and a Share of natural Heat; and the *Sphacelus* a thorough Mortification, where there is no Sense or Warmth left.

The *Gangrene* is a Disease in the Flesh of the Part which it corrupts, consumes, and turns black; spreading and seizing itself of the adjoining Parts: It proceeds from a Stoppage or Interception of the Circulation of the Blood, which by this Means fails to furnish the Part with the nutritious and spirituous Juices, necessary to preserve its Warmth and Life.

This Interception of Circulation, which is the next Cause of the *Gangrene*, is itself occasioned divers Ways, as by large Tumours, *Erysipelas*, great Inflammations, violent Cold, tight Bandages or Compressions, sudden Fluxions of the same malignant Humour, Bites of venomous Beasts, Fractures, Wounds, Ulcers ill managed, extreme Weakness, occasioned by Hæmorrhage or old Age, &c.

The *Gangrene* is distinguished by the Colour of the Flesh, which now turns pale, dusky, and sublived, and by its growing loose and flabby, of vehemently tense, which it was before, in the Progress of the Disease, the Part distills a fetid, discoloured Water, and emits a cadaverous Smell. Upon the first Seizure the Skin turns pale, afterwards livid; Vesications arise, and the Colour at length changes to black; the Flesh becomes fetid, sanious and moist, then withers and soon becomes insensible; the Heat and Pulsation of the Part being likewise diminished. If in a large Wound the Tumour of the Lips does not suppurate, nor any Flux of Matter or Inflammation arise; if the Lips do not swell, or after swelling grow lank and flaccid again on a sudden, it is reckoned a sure Sign of an approaching *Gangrene*. When it proceeds from extreme Cold, the Part affected is first benumbed, or seized with a pricking Pain, followed by a Redness, which gradually changes to black. When a tight Bandage is the Cause, a Flaccidity of the Part is joined to the Insensibility thereof: When the Scurvey, it often begins in the Great Toe, and appears in the Form of a blackish Spot, which turns to a dry Crust, succeeded by a Stupor of the Part, &c. When the Bite of any venomous Creature is the Cause, a continual Fever attends, &c. Pain is felt in the Part, which usually brings on a *Syncope* or *Delirium*, Pustules arise about the Bite, &c.

By the Microscope a *Gangrene* has been discovered to contain an infinite Number of little Worms, ingendered in the morbid Flesh; and which continually producing new Broods, they swarm and over-run the adjacent Parts.

To stop the Progress of the *Gangrene*, Physicians prescribe, internally, Sudorificks and Alexipharmicks. Externally, Decoctions of Quick Lime, either simple, or with the Addition of *Sulphur*, *Mercurius Dulcis*, and *Spirit of Wine* camphorated. In a severe Stage of the Distemper we scarify deep to the very Quick; and afterwards apply hot Liquors, Cataplasms, &c. Some recommend Horse-Dung boiled in Wine, or Urine: The *Unguent Ægyptiack* also comes into Use. *Belloste* prescribes the following as the most efficacious Remedy known for *Gangrenes*, viz. *Quicksilver* dissolved in double the Quantity of *Spirit of Nitre*, or *Aqua Fortis*; a Linen-Cloth dipped therein, and applied to the *gangrenous* Part: This alone, he assures us is sufficient. If the *Gangrene* be occasioned by an intense Frost, *Snow-Water*, or a Linen-Cloth dipp'd in cold Water, and applied to the

the Part affected, *Boerhaave* directs as the beſt Cure. If the *Gangrene* proceed to an entire *Sphacelation*, and be ſeated in any of the Limbs, or extreme Parts, Recourſe muſt be had to the Operation of Amputation; of which we'll give a Deſcription in the Sequel of this Treatiſe.

The *Panaris*, *Panaritium*, or *Paronychia*, (from the *Greek* παρονυχια, q. d. an Abſceſs at the Root of the Nails) is a Tumour or Inflammation ariſing on the Extremities of the Fingers or Toes, properly called *Whitloe*. It is occaſioned by a ſharp or ſaline Humour, lodged between the Bone and *Perioſteum*, and the Nerves and Tendons. The *Panaris*, is often attended with violent Pains, felt all along the Arm, and with a Fever.

An infallible Remedy for the *Panaris*, is to open it either with a Point of a Lancet, or with ſome Unguent, and then to dip the Finger in a *Lixivium*, made of Pine Aſhes. For the *Panaris* after Bleeding and the general Remedies, Dr. *Burnet* orders the Patient to hold his Finger a good while in rotten Eggs, or a putrified Mouſe. *Helmont* tells us, if we believe him, he has ſeen a Finger as big as an Arm by means of a *Panaris*, cured by rubbing it with Blood, then wrapping it up in a Mole-ſkin. *Riverius* adds, that to hold the Finger affected in a Cat's Ear, cures a *Panaris* in two Hours.

Childblains, are painful Tumours, often accompanied with Inflammations; they happen particularly in the nervous and external Parts, as at the Heel, and the more the Cold is ſevere, the greater is the Pain.

Childblains are cured by waſhing and holding, for ſome Time, the Heel or other Part affected in hot Wine, where have been boiled *Allum* and *Salt*, of which a Cataplaſm is made, afterwards, by adding to it *Rye-Flower*, *Honey*, and *Sulphur*. The Juice of Radiſhes applied hot, with *Unguent* of *Roſes*, is alſo a very good Remedy, as well as the *Petroleum* alone.

Burnt, is an Impreſſion of Fire made on a Part, in which remains a great deal of Heat, with Bladders full of Seroſities, or Cruſts, according as the Fire has made more or leſs Impreſſion.

The *Burnt* is cured by the quick Application of Street-Dirt, often reiterated by that of peeled *Onions*, of *Unguent* of *Roſes*, and of *Populeon*, mixed with the Yolk of an *Egg* and quick Lime. If the *Burn* be in the Face, there muſt be particularly uſed the *Mucilago* of *Quince-Seeds*, and of *Pſyllium*, of *Sperm* of *Frogs*, equal Part of each, and to four Ounces thereof muſt be added twenty Grains of *Sugar* of *Saturn*. This Remedy is ſpread on the Face with a Feather, and over it, is applied a Piece of grey Paper. This Remedy is excellent.

If the *Burn* has made a Scar, or a Cruſt, 'tis taken off with Freſh Butter, ſpread on a Cabbage-Leaf, applied hot. If the Cruſt be too hard, and don't fall, it muſt be opened for the Evacuation of the *Pus*, which would cauſe a deep Ulcer, if kept long under it. The ſame Thing is obſerved for the *Bladders* or *Puſtles*, two Days after they are riſen; and there muſt be applied to it the *Unguent* of *Quick-Lime*, with *Oil* of *Roſes*, and *Yolks* of *Eggs*.

The next Sort of *Tumours*, which fall under our Conſideration, are the *Eryſipelas*, and its Dependencies.

Erysipelas, from the *Greek*, ερυειν, *trahere*, to draw, and πελας, *prope*, near, is a ſmall Elevation, produced by a *Depoſitum* of Bile extravaſated, and running between the Fleſh and the Skin, known by its yellowiſh Colour, great Heat, and the Itching it cauſes.

The Diſeaſe ſpreads itſelf a-pace, ſhifting from one Place to another, with ſometimes a Fever attending it. It attacks the Patient all at once, and chiefly when out in the Air. Dr. *Quincy* accounts for the *Eryſipelas*, from a too ſizy Blood, which obſtructing the Capillaries, occaſions Inflammations. There is another Species of *Eryſipelas*, though leſs uſual than the former, moſt commonly ariſing from a too copious drinking of ſpirituous Liquors. It begins with a Fever, after which there is an univerſal Eruption of *Puſtules* almoſt over the whole Body, much like thoſe after the Stinging of *Nettles*, and ſometimes riſing into *Veſiculæ*; at going off they leave an intolerable Itching, and as often as ſcratched, return again.

Etmuller gives it as the diſtinguiſhing Character of an *Eryſipelas*, that, when preſſed very lightly by the Finger, there follows a white Spot, which preſently after becomes red again; which does not happen in an ordinary Inflammation, unleſs when violently preſſed. *Scorbutick* People are the moſt ſubject to this Diſeaſe.

The *Eryſipelas*, which happens on the Head, or on the Breaſt, is not without Danger; and it muſt be ſeriouſly treated with internal and external Remedies. It is diſputed whether Purging be good in the *Eryſipelas*: *Sydenham* recommends it the next after Bleeding; *Etmuller* cautions againſt them both, and recommends Diaphoreticks. M. *Le Clerc* ſays, that Bleeding is not to be uſed, unleſs there be a too great Plenitude. He preſcribes frequent Clyſters, compoſed of *Whey*, *Chervil*, *Succoree*; adding to the Decoction a Drachm of *Sal-Prunellæ*, diſſolved in two Ounces of *Honey of Violets*. Dr. *Friend* obſerves, that in the laſt Stage of an E[illegible] of the Head, attended with a *Coma*, *Delirium*, &c. unleſs Cathartick will do good, the Caſe is deſperate. All unctuous, aſtringent, and cold Applications externally, are dangerous, and ſometimes made the *Eryſipelas* degenerate into a *Gangrene*. Linen dipp'd in camphorated *Spirit of Wine* and *Saffron*, are applied with Succeſs on the *Eryſipelas*, provided they be renewed when they begin to dry.

If the Heat and Pain be exceſſive, there muſt be taken half a Drachm of *Sugar* of *Saturn*, twenty Grains of *Camphire*, as much *Opium*, with two Drachms of red *Myrrh*, mixed in half a Pint of white Wine, in which Linen muſt be dipp'd to apply on the *Eryſipelas*, renewing them often. Amidſt all theſe Remedies an exact Diet muſt be eſtabliſhed, elſe they have little or no Effect.

To repair the Diſorders which the *Eryſipelas* has cauſed in the Face, it muſt be waſhed with a Remedy prepared with half a Pint of *Whey*, two Yolks of *Eggs*, and a Drachm of *Saffron*.

Beſides *Eryſipelas*, there are alſo *Eryſipelatous Tumours* and *Apoſthumes*; ſuch as the *dry* and *humid Herpe*. The *dry Herpe* is what's commonly called *Ring-Worm*; and the *humid Herpe* are Species of Veſicles, or yellowiſh Puſtules, which cauſe an Itching, and make ſmall corroding Ulcers in the Skin. To theſe may be added all Sorts of Itchings.

For the one and the other may be uſed the Remedies preſcribed for the *Eryſipelas*, as the Lotions made with *Lime-Water*, the Decoction of *Wormwood*, and the *Sal-Armoniack*, to the Quantity of half a Drachm in four Ounces of Liquor. The *Oil* of *Tartar*, *per Deliquium*, is alſo a very good Remedy for thoſe cutaneous Diſtempers. From the *Eryſipelas* we'll paſs to the *Œdema*.

The Œdema, (from the *Greek*, οιδαω, *I ſwell*; whence οιδημα, a *Tumour*,) is in Fact a *Tumour*, which appears whitiſh, ſoft, and lax, without any notable Change of Colour, Heat, Pain, or Pulſation; and which yields to the Preſſure of the Finger, ſo as for ſome Time to retain the Dent or Impreſſion thereof.

The general Cauſe of *Œdema's* is vulgarly ſuppoſed to be a *Pituita*, as it is called, or a Phlegmous Humour in the Body. *Contuſions*, *Fractures*, *Luxations*, &c. when of long Standing, often give Riſe to *Œdemas*, eſpecially in dropſical and aged Perſons: So do irregular Living, want of Exerciſe, Ruptures, Diſorders of the Lymphaticks, Defluxions of Humours, Weakneſs of the Joints, &c.

Its chief Seat is in the Legs: In a *Leucophlegmatia* the whole Body is *Œdematous*. It frequently comes upon other Diſeaſes, eſpecially *Clinics*, i. e. thoſe which

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which oblige us to keep long our Beds; and is familiar to Women with Child. It is dangerous when it tends to an Abſceſs; when it hardens it becomes ſcirrhous.

There are alſo ſpurious *Œdemas*, in which Caſe the pituitous Humour is mixed with other Humours; whence the *Tumour* becomes Eryſipelatous, Scirrhous, and ſometimes Gypſous; and hence *Wens*, &c.

Fomentations, Cataplaſms, Liniments, and Plaiſters, are very good Remedies for the *Œdema*. The Fomentations are made with *Wall-wort*, tied in Bundles, covered with hot Wine, and put in an Oven after the Bread has been took out; they are alſo took out ſmoaking hot, the Bundles are untied, and the Part is wrapp'd up within them, covering them over with a hot Cloth. This being often reiterated, the Humour tranſpires by Sweat. The Cataplaſm are compoſed of *Chamomil*, *Melilot*, *St. John's Wort*, *Sage*, *Parietary*, the Root of *Briony*, *Onions*; the whole boiled in *white Wine*, with *Honey*. Cataplaſms are alſo made with *Horſe-Dung* and *Cummin-Seeds* boiled in ſtrong *Vinegar*, mixing with it *Barley-Flower* to the Conſiſtence of Pap. The Plaiſters are prepared with an Ounce of *Dyachilon de Gummis*, half an Ounce of *Martiatum*, a Pound of *Oil* of *Lillies*, half an Ounce of *Cummin-Seeds* in Powder, half a Drachm of *Sal-Armoniack*, and an Ounce of *yellow Wax*, to bring it to a Conſiſtence. If there was a Hardneſs, the Plaiſter made with the Gums of *Bdellium*, *Ammoniac*, and *Galbanum*, diſſolved in Vinegar, muſt be uſed.

ŒDEMATOUS *Apoſthumes*, or *Tumours*, which partake of the Nature of the *Œdema*, are, the *Phlyctains*, *Empyſema*, *Batracos*, or *Ranuncle*, the *Wyne*, the *Talpa*, the *Broncocel*, the *Ganglion*, the *Fungus*, the *King's-Evil*, and all the Species of *Dropſies*, general and particular.

The PHLYCTAINS, are Puſtules or Bladders, full of white Water, a little yellowiſh.

The EMPYSEMA, is a Tumour full of Flatuoſities or Wind, with a ſmall Quantity of *glairy Pituita*.

The BATRACOS, or *Ranuncle*, is a Bladder full of glairy Water, which grows under the Tongue at the *Frænum*.

The WYNE, is a Tumour formed of a thickened and chalky *Pituita*, and is ranked among the enkiſted Tumours.

The TALPA is a ſoft and pretty big Tumour, which grows ordinarily on the Head, and in the Face, and contains a white, thick, and pituitous Pus.

The BRONCHOCEL is a *Tumour* which grows on that Part of the Throat called *Adam's-Bitt*, and which ſwells it much, being formed of a thick Pituita, mixed with a little Blood; 'tis ranked among the enkiſted *Tumours*.

The GANGLION is a *Tumour* pretty hard, indolent, and vacillent, produced of a thickned Pituita; 'tis found alſo on ſome Nerve or Tendon.

The FUNGUS is a ſpungious *Tumour*, which grows on the bruiſed Tendons.

The KING'S-EVIL is *Tumours* formed ordinarily in the Glands of the Neck, and all other glandulous Parts of a viſcous, ſerous, and malignant *Pituita* whoſe Courſe is in the Glands of the *Meſentery*.

The DROPSY is a ſoft Tumour, made by an abundant Depoſitium of Seroſities, in the Parts where it appears. There are three general Species of *Dropſy*, viz. *Aſcites*, *Tympanites*, and *Leucophlegmatick*.

The ASCITES, is that which forms the Tumour, or Swelling of the Lower Belly, by a gathering of Water.

The TYMPANITES, is that which forms likewiſe the Tumour or Swelling of the *Abdomen*, with this Difference, that there is a great deal of Wind mixed with the Water, whereby the Skin is ſtretched ſo tight, that when ſtruck, it gives a Sound like that of a Drum, whence it has borrowed its Name.

The LEUCOPHLEGMATICK, is a Tumour, or to ſpeak better, a general Swelling of all the Parts of the Body, as well as of the *Abdomen*; 'tis formed of a glairy and mucilaginous *Pituita*; whence it happens, that the Impreſſion of the Fingers remains in the Places which have been preſſed by them.

The particular Species of *Dropſies* are thoſe which happen to different Parts, from which they borrow their Name, as the *Hydrocephalus* in the Head, the *Exomphalus* of the Navel, the *Hydrocelle* of the *Scrotum*: *Laſtly*, there is that of the Breaſt, and that of the *Matrix*.

All the Remedies preſcribed for the *Œdema* are alſo employed variouſly in all theſe Maladies, as are Liniments, Fomentations, Cataplaſms, and Plaiſters. Internal Remedies, ſuch as Diaphoreticks, Sudorificks, and Purgatives, ſupported with an exact Diet, are of great Service. The Decoction, of *Briony*, and *Marſhmallow Roots*, with *Betany*, *Liquorice*, and all other Diureticks, which puſh by Urine, give a great deal of Eaſe. From the *Œdema* we'll paſs to the *Scirrhus*.

The SCIRRHUS, (from the *Greek*, σκιρος, a Piece of Marble) is a hard indolent *Tumour*, formed gradually in the ſoft glandulous Parts of the Body; ſometimes internal and ſometimes external.

There are two Kinds of *Scirrhus's*, the one only beginning, and frequently painful, when preſſed by the Fingers; the other confirmed and ſenſeleſs. The *Scirrhus* ariſes from a thick viſcid, probably gritty Matter, detained and indurated in the Pores and other minute Paſſages of the Parts affected.

The *Scirrhus* is cured by ſoftening and reſolving it, ſeldom by bringing it to Suppuration. 'Tis ſoftened by the Application of Cataplaſms, made of the Leaves of *Violets*, *Mallows*, *Marſhmallows*, *Leeks*, *Alder*, *Rue*, and *Wormwood*; with *Camomil-Flowers*, *Horſe* and *Cow's Dung*, and Roots of *white Lillies*, all this is boiled together in Wine, to which are to be added *Honey* and *Hog's-Lard*, to make a Cataplaſm, with Crumbs of Bread. 'Tis reſolved with Plaiſters compoſed of *Diachylon*, *Melilot*, and *Mucilages*, to which are added the *Oil* of *Worms* and the *Flour* of *Sulphur*. And to render the Remedy more efficacious, the *Oil* of *Tobacco* and *Gum Ammoniack* diſſolved in Vinegar. Theſe topical or external Remedies muſt be accompanied with internal, which ſerve to prepare the Humours to be evacuated, as the Decoction of *Sarſaparilla*, the Uſe of good Wine, and light Aliments of an eaſy Digeſtion.

There are other Tumours which participate of the *Scirrhus*, as the *Polypus*, *Carcinoma*, *Sarcomæ*, *Nacte*, *Fic*, or *Deſir*, and the *Cancer*.

The POLYPUS, πολυπους or πολυπος, is a fleſhy Tumour, or Excreſcence, on the Inſide of the Noſtrils, prejudicial to Reſpiration, or Speech; call'd alſo, by way of Diſtinction, *Polypus narium*. This *Polypus* ariſes, by ſeveral Roots, from the *Os cribroſum*, and hangs down, ſometimes, as low as the Lip; growing, likewiſe, backwards, ſo as to ſtop the Hole of the Palate, whereby the Air and *Pituita* deſcend out of the Noſe, down into the Throat; and, by this Means, ſtrangles the Patient. It has its Name from the Reſemblance it bears to the Fiſh *Polypus*, call'd in *Engliſh Pourcontrel*, or *Many-feet*. Tho' ſome derive the Name from the Reſemblance its Subſtance bears to that of the *Polypus*; and others from the Reſemblance its many Roots bear to the many Feet of that Fiſh.

Polypus's are chiefly found in ſcrophulous or cancerous Conſtitutions, along with venereal Caſes, Ulcers, *Arœna's*, &c.

Polypus is alſo us'd for a morbid Excreſcence in the Heart; conſiſting of a tough Concretion of grumous Blood lodg'd therein. *Malpighi* gives a very accurate Deſcription of this *Polypus*; in the right Ventricle of the Heart, he obſerves, it is uſually larger, and of a paler Colour, like *Pituita*, with reddiſh or blackiſh Streaks. In the left Ventricle it is ſmaller, blacker, and denſer. He adds, that it ſeems to have a Sort of Organiſm, and appears like a Congeries of Pellicles ſtretch'd over one another, which forms a Kind of nervous Compages.

Polypus's are often found upon opening the Bodies of Perſons dying *Apoplectick*, and are, doubtleſs, frequently the Occaſion of ſudden Death. They are ſeldom diſcovered 'till they have diſpatched the Patient. It is a Diſpute among Phyſicians, whether *Polypus's* be produced any conſiderable Time before, or always immediately after Death. Mr. *Gould* has an expreſs Diſcourſe in the Philoſophical Tranſactions to evince the former.

There are alſo *Polypus*'s of the Lungs. Dr. *Robert Clark*, in the Philoſophical Tranſactions, gives us a very odd Inſtance of a Patient, who cough'd up, at Times, ſeveral hundred *Polypus's of the Lungs*. Theſe *Polypus's* ſeemed to have ſome Organization, and were all perfectly alike. The Patient ſaid, though they had no Life, he had frequently preſſed a ſlimy Matter out of the Body. Dr. *Liſter* obſerves that ſuch *Polypus's* are formed in the remoter and deeper Branches of the *Aſpera Arteria*, whence they are very difficult to get up. The Patient above-mentioned never brought them up 'till after a continual Coughing of half a Day and Night. He adds that they are nothing but viſcous Excretions of the ſmall Glands, hard baked in thoſe Glands, whoſe Form they receive. M. *Buſſiere* obſerves they are frequently miſtaken for Pieces of the Blood-Veſſels or Lungs.

The *Polypus* of the Noſtrils may be treated and cured in its Beginning, but it is to be feared, when neglected, or ill managed, that it ſhould degenerate into an incurable Cancer. Beſides the general Remedies, which are ſmall Bleedings, and reiterated Purgatives, with an exact Diet; there are particular ones, which are thoſe which dry up and conſume the Excreſcence, as the Decoction of *Plantin*, *Betony*, and *Parietary*, in red Wine, which muſt be drawn up the Noſe, or introduced into it with ſmall Tents, often renewed, adding to it ſome Tincture of *Myrrh*, and *Honey*. If the Diſtemper laſt too long, and cannot be conquered by Remedies, the *Chirurgeon* muſt have Recourſe to the Operation, which is the Extirpation thereof, which we'll deſcribe hereafter, when we come to Operations.

The NACTE, *Fic*, or *Longing*, is a *Tumour* or Excreſcence of the Fleſh, which grows on the Buttocks, on the Shoulders, on the Thighs, in the Face, and every where elſe; from whoſe different Figures they borrow different Names, for ſometimes 'tis a *Gooſberry*, ſometimes a *Mulberry*, a *Cherry*, &c. Sometimes they are *Fiſhes* and *Trees*, ſometimes *Birds*, or other Species of Animals, according to the urgent Deſires of the Mother during Geſtation, for Things which ſhe has not enjoyed as ſhe could wiſh. As for this Species of *Tumours*, they are not to be touched, only the Spots which Children bring along with them into the World are taken off, by the Application of the Afterbirth while yet hot.

The CANCER, is a roundiſh, hard, ragged immoveable *Tumour*, of an aſh or livid Colour; encompaſſed round with branched, turgid Veins, full of black muddy Blood; ſituate chiefly in the glandulous Parts, ſo called, as ſome will have it, from the Reſemblance it bears in Figure to the *Crab-Fiſh*, or as others ſay, becauſe, like that Fiſh, when once it has got hold, it is ſcarce poſſible to drive it away. It begins without any Pain, and appears, at firſt like a *Chicory Pea*; but grows apace, and becomes very painful.

The *Cancer* ariſes principally on the lax glandulous Parts, as the Breaſt and Emunctories; it is moſt frequent in Women, eſpecially ſuch, ſays *Stolterforth*, as are barren, or live in Celibacy. The Reaſon of its appearing in the Breaſt more than other Parts, is, that being full of Glands, with Lymphaticks and Blood-veſſels among them, the ſmalleſt Contuſion, Compreſſion, or Punction, extravaſates thoſe Liquors, which growing by Degrees acrimonious from the *Cancer*; hence a *Cancer* is that in the Glands which a *Caries* is in the Bones, and a *Grangrene* in the fleſhy Parts. The *Cancer* however is ſometimes found in other ſoft ſpungy Parts of the Body, and there have been ſome found in the Gums, Belly, Neck of the Matrix, Ureter, Lips, Noſe, Cheeks, Abdomen, Thighs, and even the Shoulders. A *Cancer* ariſing in the Legs is called a *Lepus*, on the Face and Noſe, a *noli mé Tangere*.

Cancers are divided, according to their ſeveral Stages, into occult, and open, or ulcerated. *Occult Cancers* are thoſe not arrived at their State, or not yet burſt. *Ulcerated Cancers* are known by their Roughneſs and Fullneſs of Holes, through which oozes a filthy, ſtinking, glutinous Matter, frequently yellowiſh, by their pungent Pain, which reſembles the pricking with a thouſand Pins; by their Blackneſs, the Swelling of the Lip of the Ulcer; and the Veins about it, which are blackiſh, tumid and varriceous. Sometimes the Extremities of the Blood-veſſels are gnawed off, and the Blood iſſues out in a *Cancer* of the Breaſt, the adjacent Fleſh is ſometimes ſo conſumed, that one may ſee into the Cavity of the Thorax, it occaſions a ſlow Fever, a Loathing, oftentimes Faintings, ſometimes a Dropſy, and laſtly, Death.

The immediate Cauſe of a *Cancer* ſeems to be a too corroſive volatile Salt, approaching to the Nature of Arſenick, formed by the Stagnation of Humours, *&c. Stolterforth* obſerves, that it has been often cured by Mercury and Salivation. Some take the ulcerous *Cancer* to be nothing elſe but an infinite Number of little Worms, which devour the Fleſh by Degrees. The *Cancer* is allowed the moſt terrible Evil that befalls the Body; it is uſually cured while yet a ſmall Tumour, of the Bigneſs of a Nut, or at moſt of a ſmall Egg, by Extirpation: When it ſeizes the Breaſt, or is burſt into an Ulcer, Amputation takes Place.

As it is very difficult to diſcover the *Occult Cancer*, it is often neglected, though it be of the utmoſt Conſequence, to prevent its dangerous Effects by a good Diet, and the Remedies proper to rectify the Intemperies of the Inteſtines, as are the Half-barrs, Whey, Aſſes Milk, *&c.* As for the Topicks, or external Remedies, they are not to be uſed, unleſs one would apply on the Tumour a thin Plate of Lead rubbed over with Quick-Silver; all other external Remedies ſerve only to render the Skin tender, and make it break the ſooner; the Uſe of Quick-Silver Water for Diet Drink, is alſo of a great Service on ſuch Occaſions. This Water is made by boiling an Ounce of Quick-Silver in two Pints of Water.

In *ulcerated Cancers*, beſides theſe general Remedies uſed in the *Occult*, the Topick or external, can be ſucceſsfully employed, as the Powders of Toads, Moles, Frogs, and Crab-Fiſh, calcinated and put upon it. Deterſives made with Water of Quick-Lime, adding to it ſome Camphire, or Sugar of *Saturn*, are very good.

Having thus treated of all the different Species of true Tumours, we'll paſs to the *Enkiſted* or Baſtard ones.

Enkiſted Tumours, are thoſe formed by a *Depoſitum* of mixt and corrupted Humours, whoſe Matters are contained in *Cyſtis*, or membraneous Bags.

The Species of thoſe *Tumours* are the *Steatoma*, *Atheroma*, *Meliceris*, &c. The *Steatoma* is known by its Matter, which reſembles Tallow; the *Atheroma* by its Softneſs reſembles Pap; and that of *Meliceris* reſembles Honey. Theſe three Sorts of *Tumours* are not well diſtinguiſhed externally, but they do not change the natural Colour of the Skin, which retains equally in theſe three the Impreſſion of the Fingers by which 'tis preſſed.

Theſe Sorts of *Tumours*, like the others heretofore mentioned, ſhould be reſolved; but however, the ſureſt Way is to bring them to Suppuration, and to extirpate the *Cyſtis*, which is ſubject to be filled again, after the Reſolution of the Humour. All the Remedies uſed for the *Œdemas* and *Scirrhus* are very good for theſe Tumours. The ſpecifick ones are theſe: Take Roſemary, Sage, Wormwood, Elder, Camomil, Melilot, St. John's Wort, put them to boil in White Wine,

Wine, with mercurial Honey, add to it the Seeds of Cumin pounded, and the Oil of Worms, to compoſe a Cataplaſm, which muſt be renewed twice a Day, after which, if the *Tumour* cannot be diſſipated, you muſt apply the following Plaiſter, which is excellent: Take equal Parts of *Diachilon* and of *Devigo*, four Parts of mercurial Plaiſter, melt them together, and mix with them Saffron and Oil of Tobacco, to make a Plaiſter, which you'll ſpread upon a Piece of Leather and apply on the *Tumour*, without removing it but once in eight Days to renew it.

As for the Extirpation of the *Cyſtis*, 'tis made by dividing the *Tumour* into four Parts, by procuring the Suppuration, and conſuming the *Cyſtis* by Degrees.

We'll conclude this Article of *Tumours* by the critical, malignant, peſtilential, and venereal ones.

There's this Difference between the *critical* and *malignant*, *peſtilential* and *venereal Tumours*: That the *critical Tumours* or *Apoſthumes* are indifferently all the *Tumours* formed at the laſt Period of Maladies, in whatever Part of the Body they be placed.

Malignant Apoſthumes or *Tumours*, are thoſe which are rebel to Remedies, and are cured but with very great Difficulty.

Peſtilential Tumours or *Apoſthumes*, are thoſe accompanied with a Fever, Faintings, Head-ach, which riſe principally in Time of the Plague, and which are contagious.

Venereal Tumours or *Apoſthumes*, are thoſe which appear at the lower Part of the Groin, contracted in impure Embraces.

Therefore the *Critical Apoſthume* can be *malignant*, *peſtilential*, and *venereal*. The *Malignant Apoſthumes* can be neither *critical*, nor *peſtilential*, nor *venereal*, but the *Apoſthumes peſtilential* and *venereal*, are always *malignant*.

The ordinary Species of *Critical Apoſthumes* or *Tumours*, are the Antrax, Furuncle, and Parotides. That of the *Malignant*, the Cancer, King's-Evil, and the like. That of the *Peſtilential*, the Carbuncle, which grows every where, and the Buboes, which riſe in the Groin. And that of the *Venereal* ones, the Buboes, Shankers which grow on the Yard, the Cardilomate in the Ano, *&c.*

The *venereal* Buboes are diſtinguiſhed from the *peſtilential*, in that the *peſtilential* are placed higher in the Groin than the *venereal*, and are always accompanied with a Fever, Reachings, and an univerſal Faintneſs; when as the *venereal* Buboe has no other Accidents than the common *Tumours*, which are Pain, Heat, *&c.* As for the Remedies, they are the ſame with thoſe preſcribed for other *Tumours*.

The SCORBUTUS, commonly called *Scurvy*, is a Malady ſo common here among us, that it deſerves a particular Notice. *Wallis* ſays, that the *Scurvy* is not a particular Diſeaſe, but a Legion of Diſeaſes, by its attacking the ſeveral Parts of the Body at once.

Dr. *Charleton* obſerves, that it ariſes chiefly from ſharp ſaline Particles, taken in by Inſpiration, from ſalt and corrupted Meats eaten, from bad Waters drank, from Naſtineſs, deep Chagrins, *&c.* Which Sentiment is confirmed by a daily Experience, common Sailors being more ſubject to it than others: He adds that it is contagious, which is alſo the Opinion of the *French*, who in their Hoſpitals, eſpecially at *l'Hotel-Dieu* at *Paris*, have a Ward apart for the *Scorbuticks*, who are not allowed any Communication with the other Wards.

Dr. *Quincy* will have the *Scurvy* to conſiſt in ſuch a Conſtitution wherein the Blood is unequally fluid; and hence he obſerves, it is beſt remedied by Stimuli, Exerciſe, and ſuch Means as promote Sanguification.

The moſt uſual Symptoms of the *Scurvy*, are, ſtinking Ulcers in the Mouth, a copious Salivation, Head-ach, Vertigo's, Epilepſies, Apoplexies, Paralyſies; the Face appears of a pale and dark red, ſwell'd, inflam'd, and cover'd with Puſtules; the Teeth fall, the Gums ſwell, itch, putrify, and ulcerate; they become cancerous, and the Jaws are almoſt immoveable; and the Ulcers cauſe ſometimes ſo much Diſorder, that the Jaws are all eaten with it, and the Teeth ſeen. There happens a Relaxation of the Parts, the Patients grow ſtupid and ſleepy, they breathe but with Difficulty, have a Palpitation of the Heart, cough, and faint away; they have frequent Reachings, Looſeneſſes, Gripes, have red and livid Puſtules on the Belly and natural Parts, the whole Habit of the Body grows dry, *&c.*

M. *Poupart*, in the Memoirs of the *French* Academy, gives us a very accurate Hiſtory of a particular Kind of *Scurvy*, very frequent in *Paris* in the Year 1699. The Symptoms and Conſequences of this new *Scurvy* were very extraordinary, and ſoon determin'd M. *Poupart* to conclude it ſomewhat of that cruel Plague with which the *Athenians* were ſo long, and ſo dreadfully harraſs'd; yet was it a true *Scurvy*, and the Perſons attack'd with it had the uſual ſcorbutick Symptoms.

In the Beginning of this Malady 'tis eaſily cur'd, but when it is rooted, has attack'd the *Viſcera*, or when it is a Diſeaſe of the Country, or the Patients are old, the Cure is next to impoſſible. I have ſeen Ships ſail'd from *Port L'Orient*, in *Britanny*, for the Gulph of *Mexico* in *America*, with two hundred and fifty Men on board, and return into *Europe*, after a Voyage of eight Months, with but fifty Men left, the reſt being all dead of the *Scurvy*, and thoſe left ready to die of the ſame Diſtemper; occaſion'd by the Dirtineſs and Lazineſs of the Sailors, who when they are attack'd with that Malady, keep in their Hammocks, from whence it is almoſt impoſſible to raiſe them; whereas one of the beſt Remedies for that Diſtemper is Exerciſe, and endeavouring to conquer that Drouzineſs which is one of its moſt dangerous Symptoms.

A very exact Diet is held of more Effect than the beſt Medicines; Bleeding does not avail, ſtrong Purgatives are hurtful, ſo is Sugar, and all ſweet Things. *Mercurius dulcis* us'd internally, ſo as not to ſalivate, but only raiſe a Sweating, is found excellent. *Doleus* undertakes to cure any *Scurvy* in twelve Days Time, by the Uſe of this alone, only the Patient muſt drink nothing all that Time but the Decoction of ſimple Antiſcorbuticks, ſuch as that of Horſeradiſh, Sorrel, Butterbur, Scarzonerr, Sowthiſtle, Zedoary, Polypody, Elecampane, Guaiacum, Saſſafras, Muſtard-ſeed, *Naſturtium Aquaticum*, *Triſolium*, *Paludoſum*, *&c.* Oranges, Lemons, Juniper-berries, *&c.* are alſo very good Remedies.

Cheſelden recommends a continu'd Uſe of Milk, particularly Milk Emulſions of ſweet Almonds, Decoctions of China, Broth, and other Anti-acids and Analepticks. *Etmuller* makes the Baſis of the Cure of the *Scurvy* and hypochondriacal Diſeaſes, the ſame, *viz.* copious Vomiting. Strong Catharticks, he obſerves, are prejudicial; but gentle ones good; for the Body is to be ſtill kept open. He adds, that Vinegar is hurtful, and yet the acid Juices of Fruits, and Vegetables, wholſome. Accordingly, the Uſe of Lemon-juice is much recommended by Dr. *Liſter*. For my Part, I have found very great Benefit by it, in a Voyage to the *Weſt-Indies*, while every Body on board were afflicted with the *Scurvy*, at leaſt in the Mouth, except myſelf, who had taken Care to rub my Gums, every Morning, gently, with Lemon-juice. The Decoction of Muſtard-ſeed, to waſh the Mouth with, is, to the full, as excellent. Theſe Remedies, taken internally, are very good for this Diſeaſe; *viz.* the Tincture of Flint, from ten Grains to thirty; diaphoretick Antimony, from ſix to thirty Grains; *Mercurius dulcis*, from ſix to ſixteen Grains; diaphoretick *Mars*, from ten Grains to twenty; aperitive *Crocus Martis*, from ten Grains to two Scruples; the volatile Spirit of *Sal Ammoniac*, from ſix to twenty Drops; the Spirit of *Guaiacum*, from Half a Drachm to a Drachm and a Half; *Tartarum Vitriolatum*, from ten Grains to thirty; Tincture of Antimony, from four Drops to twenty; the volatile Salt of Tartar, Urine, Vipers, and Hartſhorn, from ſix to fifteen Grains

Grains of each; Spirit of *Gum Ammoniac*, from eight Drops to ſixteen; and the mercurial *Panacea*, from ſix Grains to two Scruples.

Emollient and deterſive Clyſters muſt be adminiſter'd to the Patient when he goes to Bed, keeping his Body open with Tiſans. He may take afterwards Sudorificks, made of Decoctions of Fumitory, Wild Succory, Dandelion, *Scolopendria*, Scabious, Germander, Burrage; the Roots of *Scarzonera*, Polypody, Parſley, and Fennel; the Flowers of green Broom, Alder, Marygolds, *&c.*

The Decoctions to waſh the Mouth with, are made of Sage, Roſemary, Hyſſop, the Leaves of Oak, *Cochlearia*, Creſſes, *Nicotiana*, the Roots of *Ariſtolochia*, Tormentil, Iris, and Red Roſes.

To ſtrengthen the Gums, Gargariſms are made with ſimple Antiſcorbuticks; as the Spirit of *Cochlearia*, two Drachms; a Scruple of Spirit of Vitriol, a Scruple of common Salt, four Ounces of Roſe and Plantain-Water, two of each. If the Gums are rotten, they muſt be rubb'd with Honey of Roſes, and ſome Drops of Spirit of Salt.

To appeaſe the Pains in the Limbs, there muſt be preſcrib'd Baths and Fomentations externally; and internally the Decoction of Saſſafras, with ſome Drops of *Laudanum*.

To appeaſe the Gripes, there muſt be adminiſter'd Clyſters made of Whey, Sugar, Syrup of Poppies, *Cochlearia*, Camomil, Melilot, and Oil of Worms.

Againſt the Dropſy, the Eſſence of *Trifolium Febrinum* and Elecampane, from twenty-four Drops to thirty; which muſt be continu'd.

The Uſe of Milk hinders Vomiting; the Looſeneſs is ſtopp'd by the Spirit of Maſtick; the Fever by the Febrifuges and Antiſcorbuticks; the Spots are fomented with the Decoctions of aromatick and antiſcorbutick Herbs, with Nitre, and Unguent of Storax: For the Ulcers of the Legs, Lint cover'd with a Powder made of equal Parts of Sugar of *Saturn*, *Crocus Martis*, Myrrh, and *Mercurius dulcis*, muſt be apply'd upon them. The following Remedy is very good to ſweeten the Acidity of the Humours. Take Half an Ounce of Spirit of *Cochlearia*, two Drachms of tartariz'd Spirit of *Ammoniac*, and one Drachm of the Tincture of Worms; fifteen Drops of which Liquor are taken thrice a Day, in a Decoction of Parietary.

Againſt the *Tubercles*, take two Handfuls of the Flowers of Chamomil and Alder, two Drachms of the Roots of Briony, and a Handful of Crumbs of Bread; and have the whole boil'd in Whey for Catoplaſms. To appeaſe the Head-ach, muſt be taken twenty-five or thirty Drops of the Tincture of *Succinum*, in the antiſcorbutick Spirits, or Waters. To facilitate Reſpiration, muſt be preſcrib'd two Spoonfuls, ſeveral Times in a Day, of a Medicine made with two Drachms of antiſcorbutick Water, two Drachms of the Eſſence of Elecampane, and Half a Drachm of Spirit of Gum *Ammoniack*. To hinder the Putrefaction of the Gums, they muſt be rubb'd often with a Liquor made of a Drachm of the Tincture of Gum Lack, three Drachms of Spirit of *Cochlearia*, and fifteen or twenty Drops of Oil of Tartar *per deliquium*. All the Lotions made of Waters and Decoctions of antiſcorbutick Simples, are very good for this Uſe. They uſe at the *Hotel-Dieu*, at *Paris*, the Unguent of Storax, to take off the Spots, and reſolve the Hardneſs in the Legs.

Thus all the Symptoms of the *Scurvy* are remedied, or prevented. From which we'll paſs to the *Examen* of Wounds and Ulcers, and to the moſt eaſy Manner how to cure them; beginning with Wounds in general.

A Wound, is a recent Separation made in the ſoft, or fleſhy Parts of the Body, from an external Cauſe; and particularly the Action of ſome hard or ſharp Inſtrument. A *Wound* is a Solution of the Continuity of a fleſhy Part, made by ſome penetrating Body, while it yet remains freſh, bloody, and without Putrefaction; by which Circumſtances a *Wound* is diſtinguiſh'd from an *Ulcer*.

The two firſt Things to be obſerv'd in the Treatment of *Wounds*, are their Differences, and the Inſtruments they are made by; whence Conſequences muſt be drawn for the Application of Remedies.

The Differences of *Wounds* are taken from their Figure, or Situation. With Regard to their Figure, they are call'd long, broad, triangular, large, ſmall, ſuperficial, and deep; with Regard to their Situation, they are call'd ſimple, complicated, dangerous, or mortal.

Simple Wound, is that which only opens the Fleſh, and is attended with no other Accident.

Complicated Wound, is that attended with Accidents; as Hæmorrhages, Fractures of the Bones, Diſlocations, and the like.

Dangerous Wound, is the *complicated*, whoſe Accidents are dangerous, as when there is an Artery open'd, or prick'd, a Nerve or Tendon cut; when made near an Articulation, or is attended with Diſlocation, or Fracture.

Mortal Wound, which is commonly follow'd with Death, as is that ſituated deeply in a principal Part, and neceſſary to Life; as in the Brain, Heart, Lungs, Œſophagus, Diaphragm, Liver, Stomach, the ſmall Inteſtines, Bladder, Matrix, and generally all the great Veſſels.

The Hiſtory of a *Wound* is thus deliver'd by *Boerhaave*: Immediately upon the Solution, the Lips of the wounded Part recede further and further from each other. The Blood guſhes out, at firſt, with ſome Violence, but ſtops of itſelf; then a bloody Scab is form'd in the Cavity of the *Wound*, and a thin ruddy Humour oozes out of the Lips of the *Wound*, which begins to redden, ach, ſwell, and turn black; and (in great *Wounds*) a Fever and Thirſtineſs ſucceed. On the third or fourth Day there is found a white viſcid Pus, upon which the Heat, Redneſs, Tumour, *&c.* abate, and the Cavity gradually fills up from the Bottom upwards, and from the Circumference to the Center, with growing Fleſh. Laſtly, The *Wound* dries, and cicatrizes. But *note*, theſe Symptoms vary according to the Nature and Cauſe of the *Wound*. Thus, if it be by Inciſion, and a large Blood-Veſſel be cut, the Hæmorrhage is more violent, eſpecially if it be an Artery; in which Caſe, florid Blood flies out impetuouſly, and by Starts; if only a Vein be cut, the Flux is more moderate and equable, and the Blood of a darker Colour. If the *Wound* be attended with a Contuſion, the Hæmorrhage is ſmall.

In *Wounds* where any large Artery is quite cut in two, the Flux uſually proves mortal. A leſſer Artery cut tranſverſly, flies back againſt the ſolid Parts, and will have its Mouth ſtopp'd; if an Artery be not quite cut off, there ariſes a perpetual Flux; or if that be ſtopp'd, an *Aneuryſma*. A Nerve being cut off, flies back, produces a Pain and Obſtruction about the *Wound*, and below it a Numbneſs and waſting Immobility; the Caſe is much the ſame in *wounded* Tendons, and Membranes. *Wounds* of the temporal Muſcle are rarely cur'd, but generally bring on horrible Convulſions.

In young Children, and aged Perſons, *Wounds* frequently prove mortal which ſeem'd but ſlight. Thoſe *Wounds* generally prove troubleſome which happen in an ill State of Body, and eſpecially a low and ſpare Diet. All *Wounds* are reputed more dangerous, and difficult of Cure, in Winter, than Summer; in Autumn, than in Spring.

The Cure of *Wounds* conſiſts in helping Nature to make the Reunion of the Parts which had been divided, after having took off and appeas'd all that could be an Obſtacle to it; which are all foreign Bodies, as Bullets, Burs, Wood, Stones, *&c.* or the Accidents they are attended with; as Hæmorrhages, Inflammation, Mortification, Excreſcence of Fleſh, *Hyperſarcoſa*, Diſlocation, Fracture of a Bone, Splinters, and ſometimes a bad Air.

The

The moſt dangerous Symptoms in a *Wound*, are the Hæmorrhages, and the firſt which deſerve the Attention and Care of a *Chirurgeon*; therefore it may be ſtopp'd with a Sort of Cataplaſm made with Powder of Aloes, Dragon's-blood, Bole-Armoniack, and the Whites of Eggs, mix'd together, and apply'd to the *Wound*. But the following Remedy is excellent for that Purpoſe.

Take two Ounces of Vinegar, a Drachm of Colcothar, or red Vitriol, two Drachms of aſtringent *Crocus martis*, and beat the whole together; in which the Lint to be apply'd to the *Wound* muſt be dipp'd.

There is alſo the *actual* and *potential Cautery*, or the Ligatures alone. The *actual Cautery* is not always ſafe, becauſe the Scar made with Fire happening to fall, the Hæmorrhage begins as before; whereas a *potential Cautery* has always the deſir'd Succeſs; ſuch as this: Take very near equal Parts of Vitriol and the Powder of what's vulgarly call'd Toad's-ſtool; and apply it with ſome Lint on the Place whence the Blood flows, and the Blood will be inſtantly ſtopp'd, taking Care not to touch the Nerve or Tendon; becauſe Vitriol is capable to excite Convulſions.

Note, That I have invented a Styptick, which whether taken inwardly, or apply'd outwardly, ſtops in an Inſtant the moſt violent Hæmorrhages, without Fear of the leaſt dangerous Conſequence; ſince the Remedy is both vulnerary and ſtyptick, and can of itſelf, without any other, cure any *Wound*, whether internal or external, which is not mortal; provided it be waſh'd with it, and cover'd with Lint dipp'd in it.

If the *Wound* be attended with an Inflammation, caus'd by a foreign Body, that foreign Body muſt be immediately extracted with a proper Inſtrument. If the Inflammation is occaſion'd by a Quantity of Pus, the Pus muſt be evacuated. If it proceeds from exceſſive Pains, thoſe Pains muſt be appeas'd with anodyne Cataplaſms and Liniments; ſuch as thoſe which have been propos'd in the Cure of the Phlegmon; or the Part muſt be bath'd with an equal Quantity of Spirit of Wine and Water. Sugar of *Saturn* in Lime-water has the ſame Effect.

Againſt the Mortification of the Part, is uſed a Decoction of Wormwood, St. John's-wort, Roſemary, and Aloes made with Wine; or the Tincture of Aloes and Myrrh; or camphorated Spirit of Wine alone.

If there be Convulſion, and that Convulſion is caus'd by the Preſence of a foreign Body, that Body muſt be extracted; if it proceeds from the Nerve being wounded, there muſt be pour'd ſome Balſam of *Peru* into the *Wound*, or Oil of Lavender.

If foreign Bodies cannot be extracted with the Fingers, nor with Pincers, the Patient muſt be put in the ſame Situation he was when he receiv'd the *Wound*, the better to diſcover thoſe Bodies; or elſe Plaiſters are us'd which have the Virtue to extract them; of which this is one: Take an Ounce of good Theriack, Half a Drachm of Gum Ammoniac, a Drachm of Bdellium, two Drachms of Fat of the Wild Boar, and two Ounces of Wax; for a Plaiſter. Bullets of Lead may remain in the Fleſh, during a whole Life, without proving hurtful.

The Excreſcences of Fleſh are carry'd off with Powder of Allum, *Ægyptiacum*, or infernal Stone.

The Re-union in Wounds (after all that could have obſtructed it is carry'd off) is properly the Work of Nature, but can be procur'd by applying to it ſome Balſam of *Peru*, and approaching the Lips of the *Wound* with the Fingers, which muſt be kept as cloſe together as poſſible, with a Bandage, a glutinous Plaiſter, or a dry Seam; provided the *Wound* be but ſuperficial; keeping the Air from it: For want of Balſam of *Peru*, an excellent one may be prepar'd of the following Flowers. Take the Flowers of *Juſquiam*, and of St. John's-wort; let them macerate during a whole Summer in Oil of Hempſeed; the older this Oil is, the better, provided it be expos'd every Summer to the Sun, and kept well cork'd.

In great *Wounds* 'tis very proper to cover the *Apparatus* with ſuch a Cataplaſm as this: Take the Leaves and Flowers of Camomile and Melilot, Summits of Wormwood, Mallows, Marſhmallows, Aniſeed and Cummin-ſeed, in Powder, which muſt be boil'd together in Wine, adding to it Barley-flower, to give it a due Conſiſtence. If there was the leaſt Appearance of Gangrene, there ſhould be mix'd with it Saffron, Myrrh, Aloes, and Spirit of Wine.

It is not neceſſary to thruſt Tents into all Sorts of *Wounds*; for in the ſmall ones it ſuffices to make the Re-union with the Balſams alone; becauſe they are not to be brought to Suppuration. But the Digeſtives and Suppuratives muſt be us'd in great *Wounds*, and in thoſe with Contuſion, avoiding the bad Method of ſome *Chirurgeons*, who fill all Sorts of *Wounds*, indifferently, with Tents, *&c.* drenching flat Tents or Lints with the common Digeſtive made with Terebinth and Yolks of Eggs, with a little Brandy, or with Tincture of Myrrh and Aloes.

Laſtly, The whole Secret conſiſts in cleaning the *Wounds*, whether with Cloths, or with Injections of Tincture of Myrrh and Aloes, or with ſimple Decoctions of Wormwood, Scordium, and Bugle, in White Wine; preſcribing internally the vulnerary Decoctions of *Alchymilla*, *Veronica*, Ground-Ivy, St. John's-wort, Wormwood, Centaury, Bugle, Chervil, and others. The Sutures are often of very great Help for the Reunion of *Wounds*, which cannot be reunited by the Bandage; for Sutures are not to be made but while the *Wounds* are recent, and bleeding, when there is no Contuſion, Loſs of Subſtance, nor great Hæmorrhages; when they are not made by Bites of venomous Beaſts; when there are no great Inflammations, and the Bones are not diſcover'd; becauſe they commonly are to be exfoliated. Neither are they made on the Breaſt, becauſe of its Motion.

Inſtruments to make *Sutures* with, are ſtrait and bow'd Needles, wax'd Thread, and the Fingers.

The Antients invented a great Variety of *Sutures*, which they reduc'd to three Kinds; *Incarnatives*, *Reſtrictives*, and *Conſervatives*.

INCARNATIVE *Suture*, is thus call'd, becauſe by rejoining the Edges of a Wound, and keeping them together by means of a Thread run a-croſs with a Needle, they grow together, and incarnate as before. This they ſubdivided into five Kinds, *viz.* the *interrupted*, *intertwiſted*, *penned*, or *feathered*, with *Claſps*, and the *dry Suture*. Of theſe five, two are perfectly diſus'd, *viz.* the *feathered Suture*, and the *Suture with Claſps*; as being too barbarous, and at the ſame Time unneceſſary. The firſt was call'd *penned*, when little Pins were made Uſe of; and *feathered*, when the Barrels of Feathers, or Quills. To perform it, two or three Needles, threaded with a double Thread, were paſs'd thro' the Lips of the Wound, at a Finger's Breadth from each other, and a Pin of Feather put in the Stitch, and another Pin of Feather bound with the Ends of the ſame Thread, that the Feathers might keep the Lips of the Wound cloſe together. To perform the ſecond, they had large crooked Claſps, pointed at each End; one of which they thruſt into the upper Part of the Wound, the other into the lower, to bring the Lips together.

Theſe *Sutures*, cruel as they were, are yet known to be uſeleſs; for in the only Caſes where they ſhould ſeem ſerviceable, *viz.* in deep Wounds, where the Contraction of the fleſhy Parts keeps the Lips far aſunder, and in Wounds of Tendons, they expoſe the Patient to terrible Convulſions and Shudderings, which are avoided by diminiſhing the Dilatation of the Wounds, by moderate Compreſſions, and waiting till the Fibres relax.

RESTRICTIVE *Sutures*, were thoſe wherewith they endeavour'd to ſtop the Flux of Blood from large Wounds, where any conſiderable Veſſels were cut. To this End, they invented ſeveral Kinds, in the

Number whereof were the *Shoemakers*, *Taylors*, *Skinners*, and other Seams, each more impertinent than the other. It is evident, the very Deſign of ſuch a *Suture* is blameable; for ſuppoſing the Wound ſo exactly ſew'd up, that no Blood could eſcape thro' the Lips thereof; yet will it ſtill flow out of the Veſſels, and will thus be forc'd to make its Way between the *Laminæ* of the Muſcles; by which Means, the Part will ſwell, rot, and gangrene. Yet the *Skinner*'s *Suture*, *Sutura pellonium*, is ſtill in Uſe for Wounds of the Inteſtines. It is thus call'd, becauſe the Skinners uſe the like in ſewing up the Holes made by the Butchers in fleaing off the Skin.

CONSERVATIVE *Suture*, is that Kind of antient *Suture* whereby the Lips of large Wounds, wherein there was a Loſs of Subſtance, were prevented from receding too far; but a Bandage now ſuffices.

INTERTWISTED *Suture*, is thus call'd, becauſe the Needles being left ſticking in the Wound, the Thread is wound round them, much after the ſame Manner Taylors do the threaded Needles they keep in their Sleeves, *&c.* This *Suture* is perform'd two Ways; for either the Needles are paſſed a-croſs the Wound, or they are ſtuck on the Side thereof.

All the *Sutures* hitherto mention'd, are made with Needles and Thread; beſides which, there is another Kind call'd *dry Sutures*, which are perform'd with Glue, Size, or other proper viſcous Matter. The *dry Suture* is ordinarily made with ſmall Pieces of Leather, on linnen Cloth indented like a Saw, ſo that the Teeth may fall between each other, and the whole Row may be cloſed. The Cloth, before it is cut into this Form, is ſpread with ſome proper Plaiſter, in order to its firm Adheſion. The Plaiſters, thus prepar'd, being cut into this Form, are apply'd on the firm Fleſh, according to the Length of the Wound, reaching from it to the Diſtance of ſome Inches; and after they are dry'd, or well faſten'd to the Part, the Lips of the Wound being approach'd, they may conveniently be held together by the *Suture* in that Poſture. This Kind of *Suture* is principally us'd for Wounds in the Face, to prevent unſightly Scars; it is likewiſe convenient when the Fibres of the Muſcles are cut a-croſs, and where it is difficult, or impoſſible to apply a Bandage.

In the other Kinds of *Sutures* the Stitches ought always to be taken of a Depth proportionable to that of the Wound; Care being had to avoid the Nerves as much as poſſible. In long Wounds they are beſt begun at the Ends, but in ſhort ones at the Middle. If the Wound be angular, they muſt be begun at the Angles. Before the Knot be made, the Lips of the Wound muſt be as near, and as evenly as poſſible, approach'd near one another; the Knots are begun by that of the Middle. A ſimple one is made firſt on the Side oppoſite to that where the Matter is to be evacuated; a ſmall Compreſs of wax'd linnen Cloth may be put on that Knot, on which Compreſs muſt be made a running Knot, to be unty'd eaſily, if ſome Accident ſhould happen. If a Plaiſter is to be plac'd on the Wound after the *Suture*, a ſmall Compreſs is to be put on the Knots, leſt they ſhould ſtick to the Plaiſter. If there happens an Inflammation in the Wound, the Knots muſt be relax'd; and when the Accidents are paſt, ty'd up again: But if the Inflammation continues, the Threads muſt be cut, by paſſing a Probe under it. When the Reunion of the Wound is perfected, the Thread muſt be alſo cut, by paſſing, likewiſe, a Probe under it. To extract the Threads, a Finger muſt be apply'd on the Knot, for Fear of re-opening the Wound.

This for Wounds in general; but as we have already obſerv'd that there are ſeveral Sorts of Wounds, and we are ſenſible that every Part of the human Body is ſubject to Wounds, each of which perhaps deſerves a particular Attention and Care; we'll enter into an exact Detail of thoſe different Wounds, and endeavour to inform ourſelves how to treat them; beginning by thoſe of the Head.

Two Things are to be conſider'd in a *Wound* of the Head, *viz.* the *Wound* itſelf, and the Inſtrument which has made it. With Regard to the *Wound*, it is either *ſuperficial*, or deep. As for the Inſtrument, it helps towards forming a juſt Judgment of the *Wound*.

That *Wound* is call'd *ſuperficial*, which goes no farther than the Skin; and that *deep*, which penetrates as far as the *Pericranium*, *Cranium*, or the Subſtance of the Brain.

If the *Wound* be only *ſuperficial*, it may be cur'd with *Hungary* Water, or with Balſam, putting over it a Plaiſter of Betony, or of Chirurgeon. If the *Wound*, or the Tearing of the Skin be large, it muſt be ſew'd up.

If the *Wound* be *deep*, and in the *Pericranium*, it muſt be kept open, waiting for the Suppuration. If it penetrates as far as the *Cranium*, there is either Contuſion, or Fracture; if Contuſion, the *Chirurgeon* muſt wait for the Suppuration, and the Fall of the Splinter, by keeping the *Wound* open. If Fracture, that Fracture is either in the firſt or ſecond Table, or in both. 'Tis known to be in the ſecond Table, only, when attended with no Accidents; and in both Tables, when the Signs appear, and by the Inciſion crucial of the Fleſh, and the Diſcovery of the *Fiſſura*.

The Signs of the Fracture of both Tables of the *Cranium*, and of the Extravaſation of Blood, on the Membranes of the Brain, are the Loſs of Judgment or Reaſon, at the very Inſtant the *Wound* is receiv'd, the Hæmorrhage thro' the Noſe, Mouth, and Ears, a Drowzineſs and Heavineſs of the Head, and eſpecially bilious Vomiting; whence 'tis concluded that the Operation of the *Trepan* is abſolutely neceſſary.

The Conſequences which can be drawn from the Knowledge of the Inſtrument which has made the *Wound*, are, that the Inſtrument is either *cutting*, *pricking*, or *contunding*. If it be *cutting*, the *Wound* is *ſuperficial*, and not ſubject to any great Suppuration. If *pricking*, or pointed, the *Wound* is deeper, tho' not attended with very dangerous Conſequences. If *contunding*, there is Contuſion, which cauſes a great Suppuration, beſides a great Commotion of the Part, commonly attended with dangerous Accidents. Inductions can even be drawn from the Perſon who has wounded; for if he be a ſtrong Man, he gives a greater Blow than a weaker; even Paſſion increaſes the Violence: All which Conſiderations are not to be deſpis'd, and leave Room for very uſeful Conjectures.

Wounds in the Face are to be treated with the greateſt Care and Circumſpection, avoiding, as much as poſſible, Inciſions and Suppuration; which would cauſe Scars and Deformities in the Face. From the Head we'll deſcend to the Breaſt.

There are, likewiſe, two Things to be conſider'd in the *Wounds* of the *Breaſt*; *viz.* if the *Wound* penetrates into the Capacity, or not; which will be known by the Probe, or by a lighted Wax Candle apply'd at the Entrance of the *Wound*, making the Patient to re-aſſume the Poſture he was wounded in, and ſhutting up his Noſe and Mouth; for then the Flame of the Candle is ſeen vacillent, or wavering. Laſtly, By the Effuſion of Blood.

When the *Chirurgeon* is ſure that the *Wound* penetrates into the Capacity of the Breaſt, he muſt examine which Part is wounded, by obſerving the Situation of the *Wound*, and its Accidents. If the Lungs are wounded, there is a frothy ſpitting of bright Blood, with a Difficulty of Reſpiration, and a Cough. If ſome of the large Veſſels be open, the Patient feels a Weight in the Bottom of the Breaſt, has cold Sweats, breathes with Difficulty, vomits Blood, which likewiſe comes out of the *Wound*. If the Diaphragm is cut in its tendinous Part, the Patient has laughing Convulſions. If the Heart be wounded in its Baſis, or in its Ventricles, the Wounded faints away, and dies: But if the Probe cannot penetrate, and none of the Accidents abovemention'd appear, 'tis certain that the *Wound* is not of great Conſequence.

When

When the Wound penetrates, and there is no Part offended, but only an Effuſion of Blood on the Diaphragm, Recourſe muſt be had to the *Empyema*, otherwiſe the extravaſated Blood would putrify, cauſe Inflammation, the Gangrene, and conſequently Death. Which *Empyema* is an Operation, whereby the Matters extravaſated on the Diaphragm, are evacuated by an Aperture made on the *Breaſt*. From the *Breaſt* we'll deſcend to the *Abdomen*.

The Qualities of a Wound made in the *Abdomen*, are known by probing it, obſerving its Situation, and minding its Accidents. By probing 'tis diſcovered whether the Wound penetrates into the Capacity, or not, by making the Patient to reaſſume the Poſture in which he was wounded; by the Situation we may gueſs what Part is wounded, and by the Examen of the Accidents be entirely convinced of the Nature of the Wound. For Example, we know that one of the great Guts is open, when the Wound is in the *Hypogaſtrium*, and when the Excrements come out through the Wound; whereas we are ſure that it is a ſmall Inteſtine, when the Wound is near the Navel, and the Chyle comes out, *&c.*

In the Cure of the Wounds of the *Abdomen*, Care muſt be taken not to let the Air enter into them; they muſt be dilated to ſew the wounded Inteſtine, and reſtore it to its Place; the *Epiploon*, or *Cawl*, if it comes out through the Wound, muſt be tied and cut, leaſt growing putrid, it ſhould infect the neighbouring Parts, which muſt be waſhed with ſtrong Wine, in which have been boiled *Camomil-Flowers*, *Roſes*, and *Wormwood*; they muſt be powder'd with *Aloes*, *Myrrh*, and *Olibanum*, and the Wound ſew'd to be dreſſed outwardly; preſcribing an exact Diet to the Patient; and abſtaining, on theſe Occaſions, from Cliſters, eſpecially if one of the great Guts be wounded, uſing rather Suppoſitories, and laxative Tiſannes, or Diet Drink, to avoid Dilatation.

Another Kind of Wounds, which deſerve a particular Attention and Skill, are thoſe made with Fire-Arms. Thoſe Wounds are always with Laceration, Loſs of Subſtance, Fracaſſement, and breaking in the Bones: They are red, black, livid, and with Inflammation; they are ſeldom accompanied with *Hæmorrhages*; they are commonly round, narrower at the Entrance than at the Exit, unleſs they have been made with quartered Bullets, *&c.*

If thoſe Wounds penetrate the Subſtance of the Brain, the *Medulla Spinalis*, the Heart, the *Pericardium*, the large Veſſels, and others of the noble Parts; 'tis almoſt always preſent Death; but all the ſuperficial ones, thoſe made in any other Parts of the Body, are curable.

To do it with Judgment, and Hope of Succeſs, we muſt inform ourſelves of the Quality of the Arms which has made the Wound; for a Muſket is more dangerous than a Piſtol, and a Cannon more than a Muſket. Their Situation muſt be examined, the Accidents they are attended with; for the more they are complicated, the more dangerous they are.

The Patient muſt be put, if poſſible, in the ſame Situation he was when wounded, the eaſier to know the Direction of the Wound by the Probe, with which the Bullet muſt be ſearched, or ſome other extraneous Bodies, as *Wood*, *Burr*, *Linen*, *Stuff*, and the like, which muſt be extracted, through the ſame Aperture they have entered into it, avoiding lacerating the Part in extracting them. If the Operator has worked in vain for extraneous Bodies, he'll make a Counter-opening at the oppoſite Part, on the Place where any Hardneſs is felt, without touching the Veſſels: The Inciſion made, he muſt extract thoſe Bodies with his Finger, or ſome Inſtrument.

If the Bullet be ſo far in the Bone, that it cannot be extracted without ſplitting it, 'tis better to leave it there. If there is a great Fracaſſement of Bones in the Legs or Arms, they muſt be amputed. The Pain and Inflammation are to be appeaſed by bleeding, anodyne Topicks, cooling Clyſters, and Purgatives; if there had been a too great Effuſion of Blood, Bleeding is to be avoided.

The Purgatives muſt be very gentle, as are the *Caſſia*, *Manna*, *Tamarinds*, *Syrup of Violets*, and that of *Damaſk Roſes*. Anodynes to appeaſe the Pain are Cataplaſms made with Crumbs of *Bread*, *Milk*, *Saffron*, and the *Yolk of an Egg*. *Oil of Roſes*, alone, made hot, is a very good Remedy. To appeaſe the great Inflammations, there muſt be applied on the Part *Oil of Roſes*, the *White of an Egg*, and *Vinegar*, the whole beaten together.

Spirituous Remedies are the firſt, which are to be applied on the Wound; Lint dipp'd in camphorated *Spirit of Wine*, and applied on the Part, is excellent; but if the Blood was to flow, there ſhould be applied *Stiptick Water*, or other aſtringent Remedies, all which are to be applied hot. To haſten the Suppuration of contuſed Wounds, a Digeſtive muſt be prepared of *Oil of Roſes*, *Yolks of Eggs*, and *Terebentine of Venice*. If the Wound was on the Nerves, Tendons, or other nervous Parts, none but ſpirituous Remedies ſhould be uſed, never Unguents, which would only putrify the Parts.

The Balſam of *Peru*, the diſtilled Oils of *Terebentine*, of *Wax*, of *Lavender*, of *Bays*, and that of *Philoſophers*; the Balſam of *St. John's Wort*, *Spirit of Wine*, and *Gum Elemy*, are excellent Remedies for the Nerves. Take four Ounces of Unguent of *Althea*, a Drachm and a half of diſtill'd *Oil of Bays*, which being mixed together are applied; or, Take an Ounce of diſtill'd *Oil of Terebentine*, a Drachm of *Spirit of Wine*, half an Ounce of Camphire, mix it together, and let ſome of it be dropp'd in the Wound; or, Take a Scruple of *Euphorbium*, half an Ounce of *Terebentine*, and ſome *Wax*; mix them together, to be applied hot to the nervous Parts.

If the Wounds are deep, Injections are to be made with the following vulnerary Water; 'tis very good for all Sorts of Contuſions, for the *Gangrene* and *Ulcer*. Take ſmall *Sage*, *Mugwort*, *Comfrey*, of each four Handfuls; *Plantin*, *Nicotiana*, *Betony*, *St. John's Wort*, *Wormwood*, of each three Handfuls; *Fennel*, *Centory*, *Bugle*, *Scrophulary*, of each three Handfuls; three Ounces of round *Ariſtoloch*, and two Ounces of the long: Let the whole be in digeſting, during thirty Hours, in eight Quarts of good white Wine, and diſtill'd afterwards in *Balneo Mariæ*, to the Conſumption of a third Part.

If the *Gangrene* happens to the Part, we'll uſe the *Spirit of Matricaria*, made of two Drachms of *Maſtick*, *Myrrh*, *Olibanum*, *Succinum*, and a Quart of Wine rectified; the whole muſt be diſtilled. This is a very good Fomentation: Take equal Parts of camphorated Wine, and of Water of *Quick Lime*, with two Drachms of *Campbor*. This Fomentation muſt be applied hot.

We'll ſubjoin to this ſome Remedies for *Burns* with Gunpowder. If the *Burn* be recent, and the Skin not ulcerated, the firſt Remedy to be applied to it is the *Spirit of Wine* or *Brandy*; or an Unguent ſhall be made of *Oil of Olives*, or of *Bitter Almonds*, of *Salt*, of Juice of *Onions*, and with liquid *Verjuice*. If the Skin is ulcerated, an Unguent muſt be made of the ſecond Bark of *Alder*, boiled in *Oil of Olives*; after 'tis ſtrained, there muſt be added to it two Parts of *Ceruſe*, with one of *burnt Lead*, which muſt be agitated in a Mortar to make a Liniment of it.

The Grains of Powder left in the Skin muſt not be extracted, becauſe they break, and thereby engage themſelves more in the Skin; therefore they muſt be left to come out in the Suppuration.

When the Wound is ſuperficial, and the Skin is yet whole, the *Onions* pounded with common *Honey*, are a very good Remedy; but if the Skin be lacerated, they muſt not be uſed, ſince they would cauſe too much Pain. The *Oil of Tartar*, *per Deliquium*, is a very excellent Remedy.

If a *Fever* follows the *Burn*, it muſt be appeaſed with *fix'd Nitre* prepared with *Antimony*, taken internally,

ternally is very good. For external Remedies, if the *Burn* be but ſuperficial, you'll take *Onions* and *Quick Lime* ſlacken, with a Decoction of *Radiſhes*; which Water muſt be applied hot, with double Compreſſes dipp'd in it. This is a very great Remedy: Take *Quick Lime*, and throw it into common Water, that the Water may riſe above it at the Heighth of four or five Fingers; when the Ebullition is over, pour into it *Oil of Roſes*, the whole will congeal like Butter, and muſt be applied on the *Burn*.

There is alſo a very good Lotion made with the Juices of *Garlick* and *Onions*, when the *Burns* are recent or new. *Crab-Fiſhes* pounded alive in a Mortar, to have the Juice of them, is a good Remedy: Or, mix the *Crab-Fiſhes* pounded with freſh Butter without Salt, and let them boil together, 'till they have acquired the Conſiſtence of Unguent.

If the *Burn* be very ſtrong, and with *Puſtules*, *Etmuller* will have it opened, and applied upon it the Unguent made with *Hen's-Dung* boiled with Freſh Butter: Or, Take a Handful of *green Sage*, two Handfuls of *Plantin*, ſix Ounces of *Freſh Butter* without *Salt*, three Ounces of *Hen's-Dung*, the neweſt and whiteſt that can be found; fry the whole during a Quarter of an Hour, ſtrain it and keep it.

If the *Burn* be ſtill greater, and there be a Cruſt upon it, all the *Puſtules* muſt be opened, the *Chirurgeon* working the two firſt Days, to make the Scar fall, by making a Liniment to it with *Freſh Butter* beaten in a Mortar, with the Decoction of *Mallows*, which Remedy muſt be ſpread upon hot *Colewort-Leaves*, and applied on the Scar, which will fall.

If the Scar be too hard, and too obſtinate, Inciſions muſt be made into it for the Evacuation of the *Sanies*, for Fear it ſhould breed a putrid and deep *Ulcer*. After the Evacuation of the Matter, there muſt be applied to it the Emollients above-mentioned, 'till the Separation of the Scar; then the *Ulcer* muſt be conſolidated, with the Digeſtives and Mundicatives, which are Unguent of *Quick Lime*, with *Oil of Roſes* and *Yolks of Eggs*. The camphorated white *Unguentum* is very good.

If the *Gangrene* happens, Sudorificks are to be preſcribed, ſuch as the camphorated *Treacle Water*, the *Eſſence* and *Spirit of Alder*, the *Spirit of Hartſhorn*, with its *Salt*, &c.

For external Remedies, when the *Gangrene* is but juſt begun, *Spirit of Wine*, applied hot, is very good; if *Aloes*, *Olibanum*, and *Myrrh* be mixed with it, it will be ſtill better. *Camphor* muſt always be mixed in external Remedies for the *Gangrene*. The Decoction of *Quick Lime*, in which have been boiled *Sulphur*, *Mercurius Dulcis*, and *Spirit of Wine*, is an excellent Remedy. When the *Gangrene* is come to a certain Head, the Part muſt be ſcarified deep, and covered afterwards with a Cataplaſm made of *Horſe-Dung*, boiled in Wine. This Remedy is ſure. If the *Sphacelus* begins, the Part muſt be ſcarified, putting upon it a great deal of *Unguent Ægyptiacum*, and over it the Cataplaſms above deſcribed. When the *Gangrene* is degenerated into a *Sphacele*, all that's dead muſt be cut off. From *Wounds* we'll paſs to *Ulcers*.

ULCER, *Ulcus*, is a Solution or Diſcontinuity of Texture, or Loſs of Subſtance in the fleſhy Parts of the Body, proceeding from an internal Cauſe. *Galen* defines *Ulcer*, an inveterate Eroſion of the ſoft Parts of the Body; by which inſtead of Blood, they are brought to yield a kind of *Pus* or *Sanies*, which prevents the Conſolidation. *Etmuller* defines an *Ulcer*, a Solution of Continuity from ſome corroſive Sharpneſs or Acidity, that takes away from the Parts, and turns the proper Nouriſhment of the Body into a ſanious Matter. *Galen* commonly uſes the Word *Ulcer* and *Wound* indifferently, but the *Arabs*, and the Moderns after them, diſtinguiſh between the two, and with a juſt Reaſon; ſince a Wound proceeds always from an external Cauſe, and an *Ulcer* from an internal, *viz.* from the Humours which fall on a Part, or from a Wound, which having not been cured in Time, has degenerated into an *Ulcer*, occaſioned by the Malignity of its *Pus*.

The Cauſes which produce *Ulcers*, and the Accidents they are attended with, make their Difference. From their Cauſes, they are called *ſimple*, *malignant*, *great*, *ſmall*, *dangerous*, or *mortal*; and from their Accidents, *putrid*, *corroſive*, *cavernous*, *fiſtulous*, and *cancrous*.

PUTRID, or *ſordid Ulcer*, is that, whoſe Sides are lined with a tough, viſcous Humour, and is alſo attended with Heat, Pain, Inflammation, and a large Flux of Humours to the Part: With Time the Sordes increaſe and change Colour, the *Ulcer* corrupts, its Matter grows fetid, and ſometimes the Part gangrenes. *Putrid Fevers* often give Riſe to this Kind of *Ulcer*.

CORROSIVE, or *Phagedænic Ulcer*, is that which by the Acrimony and Malignity of its Sanies, eats away the adjacent Parts all around; the Lips thereof remaining tumefied. When this Kind of *Ulcer* eats deep, and ſpreads wide, without being attended with a Tumour, but putrifies and grows foul and fetid, it is called *Noma*, and both on Account of the Difficulty wherewith they heal, are alſo termed *Dyſepulota*.

CAVERNOUS *Ulcer*, is that whoſe Entrance is narrow, and Bottom large, in which there are ſeveral Holes, without Calloſity in its Borders, full of a malignant Sanies.

FISTULOUS *Ulcer*, is that which has long Holes, narrow, and deep, with Calloſity in its Borders, and whoſe Sanies is ſometimes virulent, and ſometimes not.

CANCROUS *Ulcer* is large, its Lips are ſwelled, hard, and knotted, of a brown Colour, with big Veins all around it, full of a livid, blackiſh Blood; whoſe Bottom is full of round Cavities, of a very offenſive Smell, becauſe of the bad Qualities of the Sanies, which runs from it.

There are other Species of *Ulcers*, as *verminous*, *varicous*, *ſinuous*, *verolick*, *ſcorbutick*, and others.

VERMINOUS *Ulcer*, is that where the Matter being thick, does not flow away, but generates Worms, &c.

VARICOUS *Ulcers*, are ſuch, as being ſeated in the Veins, and becoming painful and inflammatory, ſwell up the Part they poſſeſs. Theſe when recent being occaſioned by the Uſe of Corroſives, or proceeding from a ruptured Varix, are often attended with an *Hæmorrhage*. The Veins adjacent to the *Ulcers* are, in this Caſe, preternaturally diſtended, and may ſometimes be felt intervowen together, like Net-work, about the Part.

SINUOUS *Ulcers*, are ſuch as run aſlant, or Sideways, from their Orifice; and may be known, either by ſearching with the *Probe*, *Wax Candle*, &c. or the Quantity of Matter they diſcharge, in Proportion to their apparent Magnitude. Theſe ſometimes lie deep, and have ſeveral Turnings: They are diſtinguiſhed from *Fiſtula*'s, only by their Want of Calloſity, except in the very Orifice.

Old Ulcers are rarely cured without the Uſe of internal Remedies, which are to be ſuch as deſtroy and abſorb the Acidity; Sudorificks, eſpecially Decoctions of the Woods, Antimonials, Viperines, and Volatiles; but above all Things Vomitories often repeated, in the moſt obſtinate *Ulcers*, mercurial Salivation is often required. *Old Ulcers* are frequently incurable, without making an Iſſue in the oppoſite Part.

The Cure of *ſimple*, *ſhallow Ulcers* is commonly effected by applying a Pledget armed with *Liniment Arcæi*, or *Baſilick Flower* to the Part; a Plaiſter of *Diachil. Simp.* or *de Minio*, being laid over it, and repeating the Dreſſing once a Day, or ſeldomer. If only the *Cuticula* be loſt, or eaten away, nothing more than a little *Unguent. Deſicativ. Rub.* or *Diapanphol*, &c. ſpread thin upon Linen need be applied.

If ſpungy Fleſh ſhould grow up, in either Caſe, it may be kept down with a little *Roman Vitriol*, &c. as in Caſe of healing up the ſimple *Ulcers*, made by the breaking of common Tumours. Evacuations are indiſpenſibly

diſpenſibly neceſſary, in the Cure of *Ulcers* of the compound Kind, where the Conſtitution will admit thereof. If the *Ulcer* be fiſtulous, ſinuous, cancerous, *&c.* and the Matter fetid, thin, or ſanious, it is found proper to join Calomel with the Purgatives, or to give it in ſmall Doſes, between the Repetitions thereof, ſo as not to ſalivate.

Beſides the Uſe of evacuating Medicines, it will here alſo be proper to order a Courſe of Diet-Drink, made with the ſudorifick Woods, eſpecially where the *Ulcer* is ſuſpected to be venereal. In the mean Time, proper Dreſſings are to be uſed.

When the *Ulcer* obſtinately reſiſts this Treatment, a Salivation is generally propoſed, and ſeldom fails to promote the Cure, tho' all other Remedies ſhould have been try'd in vain. If the Patient be too weak to undergo the Fatigue of a thorough Salivation, it may be moderated, and kept up the longer, in Proportion to his Strength.

External Medicines, for *Ulcers*, are Digeſtives, Cleanſers, Sarcoticks, and Epuloricks. M. *Bullock* gives us a Medicine of ſingular Efficacy in the Cure of *Ulcers*; and it is no more than a Decoction of Walnut-tree Leaves in Water, with a little Sugar; in which a linnen Cloth being dipp'd, is to be laid on the *Ulcer*, and this to be repeated every ſecond or third Day. This ſimple and vulgar Medicine, he finds, ſuppurates, deterges, incarnates, reſiſts Putrefaction, *&c.* more than any other Medicine known; tho' I can aſſure that my vulnerary Tincture produces the ſame Effect, even in the moſt rebellious *Ulcers*, with the ſole Aſſiſtance of gentle and moſt common Purgatives.

The *Venereal Diſeaſe* falls next under our Conſideration, which we deſign to examine thro' its different Stages; *viz.* the *Clap*, *Chordee*, *Gonorrhœa*, *Shankers*, *Bubo's*, and the *Grand Pox*.

VENEREAL DISEASE, *Lues venerea*, in *France* call'd *Mal de Naples*, (the *French* having brought it from thence, at their Return from the Conqueſt of that Kingdom, under *Charles* VIII.) in *England*, *French Pox*; is a contagious Malady, contracted by ſome impure Humour, generally receiv'd in *Coition*; and diſcovering itſelf in Ulcers, and Pains about the genital, and other Parts.

It is uſually ſaid that it made its firſt Appearance in *Europe* in the Year 1493; tho' others will have it much older, and contend for its being known to the Antients, only under other Names. M. *Becket*, particularly, has attempted to ſhew, that it is the ſame with what among our Forefathers was call'd the *Leproſy*, and which, in many of our *Engliſh* Writings, Charters, *&c.* is call'd *Brenning*, or *Burning*. In order to prove his Point, he has ſearch'd the Records relating to the Stews antiently kept on the Bank-ſide, *Southwark*, under the Juriſdiction of the Biſhop of *Wincheſter*. Among other Conſtitutions of theſe Stews, dated 1162, it was appointed, 'That no 'Stew-holders ſhould keep any Woman that has the 'perilous Infirmity of BURNING.' And in another Vellom Manuſcript, now in the Cuſtody of the Biſhop of *Wincheſter*, dated 1430, it is again order'd, 'That 'no Stew-holder keep any Woman within his Houſe 'that has any Sickneſs of BURNING, but that ſhe be 'put out upon a Pain of making a Fine unto the 'Lord of a hundred Shillings.'

To confirm this Account, M. *Becket* quotes a Deſcription of the Diſeaſe from a Manuſcript of *John Arden*, Eſq; *Chirurgeon* to King *Richard* II, and King *Henry* IV. *Arden* defines the Diſeaſe call'd *Brenning*, *Incendium*, to be a certain inward Heat, and Excoriation of the *Urethra*; which Definition, M. *Becket* obſerves, gives us a perfect Idea of what we now call a *Clap*; agreeable to the lateſt and moſt exact anatomical Diſcoveries, and free of all the Errors of *Platerus*, *Rondeletius*, *Bartholine*, *Wharton*, and other later Writers on this Diſeaſe.

As to the *Leproſy* being the ſame with this *venereal Diſeaſe*, it muſt be own'd, there are a good many Symptoms in the one Diſeaſe which quadrate well enough with thoſe in the other; but then the Symptoms in each are ſo precarious, that a great deal of Streſs cannot be laid hereon.

The common Tradition is, that the *venereal Diſeaſe* firſt broke out in the *French* Army, when it lay encamp'd before *Naples*; and that it was owing to ſome unwholſome Food: On which Account the *French* call it, as we have already obſerv'd, the *Neapolitan Diſeaſe*, and the *Italians* the *Mal Franceſe*: But others go much higher, and ſuppoſe it to be the *Ulcer Job* complains of ſo grievouſly. And accordingly, in a *Miſſal* printed at *Venice* in 1542, there is a Maſs in Honour of St. *Job*, to be ſaid for thoſe recover'd of this Diſeaſe; as being ſuppoſed to owe their Deliverance to his Interceſſion. But the Opinion which prevails moſt among the more knowing of our Phyſicians, is, that the *Diſeaſe* is of *Indian* Extraction; and that it was brought hither by the *Spaniards* from the *American* Iſlands, where it was very common before ever the *Spaniards* ſet Footing there: Whence the *Spaniards* call it *Sarva des India*, or *Las Buvas*; notwithſtanding what *Herrera* ſays, that the *Spaniards* carry'd it to *Mexico*, inſtead of bringing it thence.

Dr. *Liſter*, and others, take it to have had its firſt Riſe from ſome of the ſerpentine Kind; either from a Bite thereof, or from ſome of their Fleſh taken as Food. This is pretty certain, that Men bitten or ſtung by Scorpions, are greatly eas'd by *Coition*; but the Woman, *Pliny* aſſures us, receives a deal of Damage thereby; which is no ſlender Argument of the Diſeaſe's ariſing from ſome Perſon ſo poiſon'd. *Liſter* adds, that there is no Room to doubt but that the *Lues* aroſe from ſome ſuch Cauſe; for upon any venomous Bite the *Penis* becomes vehemently extended, and the Patient being ſeiz'd with a *Satyriaſis*, breathes nothing but Rage and Luſt; Nature, in Effect, ſeeming to direct him to Coition for a Remedy.

For my Part, I do not ſee what Occaſion we have to ranſack Antiquity ſo far as to rake honeſt *Job*'s Aſhes, (if there ever was ſuch a Man as *Job*) or to run to the remoteſt Climates in Queſt of the Origin of a Diſeaſe which we can ſo eaſily find in ours, and among us. 'Tis alſo as ridiculous to tax the irrational Part of Animals with it; unleſs we mean thereby, that thoſe who are not aſham'd to become the deſpicable Slaves of their Brutality, have for that Time forfeited their Reaſon, and are turn'd Brutes; for, in my Opinion, if we be pleas'd to trace the true Origin of the *venereal Diſeaſe*, we ſhall find it in thoſe common Proſtitutes who abandon themſelves to all Sorts of Perſons, without Diſtinction of Age, Conſtitution, *&c.* and whoſe *Matrix*, like a Common-Sewer, receives indifferently, in a ſhort Space of Time, ſeveral Seeds of different Conſiſtence and Qualities; which being diveſted, ſoon after the Ejaculation, of thoſe Spirits in which conſiſted their Life and Elaſticity, remains a viſcous and dead Subſtance, which from that Inſtant tends towards a Solution of Continuity in its Parts, no longer kept united by the Direction and Agitation of its moſt ſubtil Particles. That Matter ſoon corrupted, forms a Filth in the Part, whoſe putrid Particles being exalted by the Heat of the Body, irritate the Veſſels, dilate their Pores, and inſinuating themſelves thro' them, gain the Fluids, and accompanying them in the Circulation, have ſoon corrupted the whole Maſs. This Syſtem appears to me ſo true, that the monthly Evacuations in Women, whereby that Filth is waſh'd out, and carry'd away from the *Matrix*, is often a Sort of Preſervative againſt that Diſtemper; and that for the ſame Reaſon they are not ſo apt to contract it as Men are. And if that Diſtemper was almoſt unknown to our Forefathers, 'tis becauſe our Foremothers were more virtuous than their Grand-daughters.

Phyſicians and *Chirurgeons* divide the *venereal Diſeaſe* into ſeveral Stages, of which the *Clap* is the firſt.

Dr. *Cockburn*, and others after him, will have the *Clap* to conſiſt in an Ulceration of the Mouths of the

Glands, of the *Urethra* in Men, and of the glandular *Lacunæ* in Women; occaſion'd by the Inſinuation of an acrimonious purulent Matter, contracted from an infected Perſon in *actu Coitus*. From theſe Glands iſſues or gleets a ſharp, corroſive Matter, accompanied with Heat of Urine, *Chordee*, *&c.* which make what's uſually term'd the firſt Stage of the Diſtemper. A *Clap* appears ſometimes ſooner, and other Times later, tho' generally in about three or four Days after the Infection is receiv'd; and diſcovers itſelf by a painful Tenſion in the *Penis*, an excruciating Pain in making Water; by the Urine appearing whitiſh, and full of ſmall Threads. Sometimes the Teſticles are ſwell'd, as well as the Glans and the Prepuce; and ſometimes, alſo, there is a Running of a yelloviſh, greeniſh, *&c.* Matter.

If the Perſon be affected with a *Phimoſis*, or *Paraphimoſis*; if the Running be of a thin Conſiſtence, a yellow or green Colour, and in great Quantity, and the Teſticles ſwell'd, it is uſually term'd a *Gonorrhœa virulenta*, and the *Clap* ſuppos'd to be in its ſecond Stage. Some Authors think, that in this Degree, or Stage, the Infection has reach'd the Maſs of Blood, and the *Veſiculæ Seminales*; others inſiſt that the Symptoms may be accounted for from the Running, or *Virus* being more corroſive; and by that Means irritating and inflaming the adjacent Parts.

In *France* they uſed to begin the Cure of a *Clap* by Bleeding, if there was a great Inflammation in the Part, then adminiſter'd to the Patient cooling and diuretick Diet-Drinks, and Emulſions made with cold Seeds in Whey. A very good Ptiſane, or Diet-Drink, which can be made every where, and at all Times, is to put a Quarter of an Ounce of refin'd Salt-petre on each Pint of Water, of which the Patient muſt drink as often as poſſibly he can; this Diet-Drink is very cooling and diuretick, and he muſt uſe it till the Inflammation be appeas'd. He muſt afterwards be purg'd with gentle Remedies, at firſt, *v. g.* this made of *Caſſia* and Manna, an Ounce of each in two Glaſſes of Whey, taken an Hour or two after one another. Then he muſt be purg'd, afterwards, ſeveral Times, with twelve Grains of Scammony, and ten of Calomel; which Remedies are to be continu'd till 'tis ſeen that the Running is no longer yelloviſh, nor greeniſh, nor of any other bad Colour. When it turns white, and ſpine, it muſt be ſtopp'd with Aſtringents, ſuch as powder'd *Carabé*, aſtringent *Crocus martis*, or its Extract, from Half a Drachm to a Drachm. When the Running is ſtopped, for to be certain of a perfect Cure, there muſt be preſcrib'd a Drachm of mercurial *Panacea*, to be taken at three different Times, in Conſerve of Roſes. And if there ſhould happen to be a ſmall Spitting, it muſt be left going on, ſince it can be eaſily ſtopp'd afterwards, by Purgations.

Late Authors, eſpecially Dr. *Cockburn*, have inſiſted on the Cure of a *Clap* by a particular Injection, without the Uſe of any other Medicine. This has given a Handle to Quacks, who, by affecting to do the ſame by their Injections, generally check the Running, and make a confirm'd Pox. M. *Le Clerc* preſcribes the Uſe of Injections, while the Aſtringents are taken; and will have thoſe Injections made with the medicamentous Stone, of which a Drachm muſt be put on eight Ounces of Plantain-water. The ſame Author forbids the Uſe of Mercury, while the *Chirurgeon* is endeavouring to ſtop the *Gonorrhœa*; becauſe, ſays he, Mercury is a Melter, which is good but while the Glands of the Groins, or the Teſticles are tumify'd, or when the Running is ſtopp'd too ſoon.

A *Clap* is often attended with an Inflammation and Contraction of the *Frænum*, and the under Part of the *Penis* call'd *Chordee*, and which renders Erection painful. It generally is proportionable to the Degrees of the *Virus* receiv'd; ſo that in virulent *Gonorrhœa's* it is uſually a very troubleſome Symptom. It proceeds from the Acrimony of the Matter which runs from the *Urethra*, irritating the under Part of the Yard; by which it is, as it were, ty'd, or held forcibly downwards in Erection, eſpecially its *Frænum*. When the Acrimony is conſiderable, it ſometimes gives Riſe to unnatural Erections, or the Symptom call'd a *Priapiſm*. If the *Chordee* be violent, or does not decreaſe proportionably to the other Symptoms in *Gonorrhœa's*, an Emetick of Turbith Mineral is uſually given with Succeſs, it cauſing a Revulſion from the Part.

Clap is alſo often call'd a *virulent Gonorrhœa*, to diſtinguiſh it from a ſimple *Gonorrhœa*, or that without *Virus* or Malignity which takes its Riſe from violent Exerciſes, and Strainings; the immoderate Uſe of hot Foods, and particularly fermented Liquors, as Beer, Wine, Cyder, *&c.* This is cur'd by indulging Reſt, nouriſhing Foods, Broths, *&c.*

The Cauſe of the *virulent Gonorrhœa*, according to M. *Littre*, is ſome acid Humour, heated, rarefy'd, and raiſed at the Time of *Coition*, from the internal Parts of the *Pudendum* of a Woman infected, and lodg'd in the *Urethra* of the Man. It has different Seats in the Body; ſometimes it only fixes on *Cowper's* mucous Glands; ſometimes on the *Proſtates*; and ſometimes on the *Veſiculæ Seminales*: Sometimes it poſſeſſes two, and ſometimes all three of theſe Places at once. From this Diverſity of Seats of the *Gonorrhœa virulenta*, M. *Littre* makes two Sorts; *ſimple*, which only affects one of the three Parts; and *compound*, or *complicated*, where ſeveral are affected. That ſeated in the mucous Glands, he obſerves, may remain ſimple, thro' the whole Courſe of the Diſeaſe, by reaſon the Mouths of thoſe Glands open into the *Urethra*, an Inch and a Half on this Side the *Proſtates*, and alſo look down towards the Glands, ſo that their Liquor is eaſily diſcharg'd. The other two Sorts mutually produce each other, by reaſon the Ducts of the *Veſiculæ Seminales* terminate in the *Urethra* in the Middle of thoſe of the *Proſtates*; ſo that there is an eaſy Communication between them.

That ſeated in the mucous Glands, is much the rareſt Caſe, and the eaſieſt cur'd. The Cure is effected by emollient Cataplaſms, and Fomentations upon the Part, and a Half-Bath. For the other Species, more powerful Means are to be us'd. The principal Remedies are mercurial Purges, an Emulſion of green Hempſeed, Cuttle-fiſh Bone, Turpentine, *Saccharum Saturni*, *&c.* we have, likewiſe, great Commendations of green Precipitate of Mercury, and *Mercurius dulcis*. *Balſ. Saturn. Terebinthinatum*, prepar'd with a gentle Fire, of *Saccharum Saturni*, and Oil of Turpentine, is much applauded where the Heat is great about the Reins and Genitals; as alſo Camphor. An Infuſion of Cantharides in Wine is the *Noſtrum* of a noted *Dutch* Phyſician. Reſin of the Wood *Guiacum* is alſo recommended; and Balſam of *Cupaiba* is held a Sort of Specifick; to which muſt be added, *Antimonium Diaphoreticum*, *Bezoardium minerale*, Water wherein Mercury has been boil'd; Injections of Lime-water, *Mercurius dulcis*, *Saccharum Saturni*, &c.

Pitcairn's Method of curing the *Gonorrhœa virulenta*, is as follows: In the Beginning of the Diſeaſe he purges with a laxative Ptiſan of Senna, Salt of Tartar, and Melilot Flowers; and gives the Patient Whey for his Drink. After three or four Days are ſpent in Purging, if the Scalding of the Urine and the Flux be abated, and the Colour and Conſiſtence of the Matter improv'd; he adminiſters Bolus's of Turpentine and *Rhaponticum*, for 6 or 7 Days; and if they keep the Body looſe, ſo much the better. By all Means Aſtringents are to be avoided; the *Gonorrhœa* being ſcarce ever known to degenerate into a Pox, unleſs too haſtily ſtopp'd.

Du Bleguy directs the Cure of the *Gonorrhœa* to begin with a gentle Cathartick of Caſſia, Senna, Chryſtal Mineral, Tamarinds, Althæa, and Rhubarb, adminiſter'd every other Day; then Diureticks, particularly thoſe of Turpentine; and, laſtly, gentle Aſtringents; as Mineral-water, *Crocus martis aſtringens*, Tincture of Roſes, Tincture of Coral in Cochineal, *&c.*

In

In my *chymical* Experiments, I have found two Remedies which can anſwer all the Expectations of a *Chirurgeon* in the Cure of a *Clap*, throughout all its Stages. The one is, a Preparation of Salt of Tartar and of *Antimonium diaphoreticum*, with the Spirit of Vitriol. This Remedy is cathartick, diaphoretick, and diuretick; and therefore purges gently, by Stool, Urine, and inſenſible Tranſpiration, without confining the Patient, otherwiſe than to a moderate Diet, and abſtaining from ſtrong Liquors, Pulſe, ſalt Meats, *&c.* till the Cure be perfected; which commonly happens in 10 or 12 Days. The ſecond Remedy is a Liquid, which is both a Cleanſer and an Aſtringent, and is adminiſter'd 20 Drops to each Doſe, to ſtop the Running, and to conſolidate the relax'd Veſſels by Degrees.

I conſider SHANKERS as the next Thing in the *venereal Diſeaſe* worthy the Attention and Care of a judicious *Chirurgeon*. *Shankers* are round Ulcers, cav'd in the Middle, which riſe on the Glans and the Prepuce.

To cure *Shankers*, they muſt be touch'd with the *infernal* Stone, and brought to Suppuration, with red Precipitate, mix'd with the Unguent of *André de la Croix*. Oil of Mercury, put upon Lint, is very good to open *Shankers*, and to conſume the Fleſh. The Patient muſt be very well purg'd with Calomel and Scammony; after which, he muſt take the mercurial *Panacea's*, which is a very good Remedy for all but a confirm'd Pox.

Next to *Shankers* come BUBO's, which are large Tumours, or Abſceſſes happening in the Groin. *Buboes* muſt not be left to come to a perfect Maturity before they be open'd; becauſe the Matter, by ſojourning too long, would chance to be carry'd into the Blood by the Circulation, and cauſe the *Pox*; therefore they muſt be open'd ſoon, with a Lancet, or a long Train of potential Cauteries, if they be too hard. They muſt ſuppurate a long while, and Care muſt be taken to purge the Patient with Calomel and Scammony.

All theſe abovemention'd are but the Branches of that corrupted *Trunk*, or rather the Forerunners of that cruel Devaſtator of a human Conſtitution the *Pox*, which ſometimes begins by a virulent *Gonorrhœa*. The Patient feels a Wearineſs in all his Members; it is accompanied with a Salivation and Headach, which increaſe at Night; excruciating Pains are felt in the Arms and Legs; the Palate is ſometimes ulcerated. If the *Pox* be an old one, there happens a *Caries* in the Bones. The Skin of the Patient is cover'd with round red Spots, and dry Puſtules; the Cartilages of the Noſe are ſometimes gnaw'd. There are *Exoſtoſes*. When the *Pox* is come to its Height, the Hairs fall, the Gums are ulcerated, the Teeth ſhake and fall, the whole Body dries up, the Eyes grow livid, the Noſe ſtinking, and the *Amigdalæ* ſwell. Ulcers grow in the natural Parts, and *Buboes* in the Groin; Worms in the Glans and Prepuce, and *Condiloma's* in *Ano*.

When the *Pox* is but juſt begun, 'tis eaſily cur'd; but if it be an old confirm'd one, and the Patient of a bad Conſtitution, has his Voice hoarſe, and Ulcers, *Caries*, and *Exoſtoſes*; the Cure is very difficult.

The Spring and Summer are the two Seaſons moſt proper to undertake the Cure of the *Pox*; which Cure muſt begin by an exact Diet. The Patient muſt be plac'd in a warm Apartment, and feed on Chickens, and other ſuch Aliments. He muſt drink ſudorifick Decoctions made with *Guiacum*, China, Sarſaparilla, and eat nothing ſalted, pepper'd, *&c.* Clyſters muſt be adminiſter'd to him, to keep his Body open; he muſt be let Blood, and purg'd with 8 Grains of Reſin of Jalap, and 10 of Calomel; which Purgations muſt be reiterated as often as the *Chirurgeon* ſhall judge proper. He muſt afterwards take the Bath, during 8 Days ſucceſſively, Morning and Night; during the Bath, he muſt take the volatile Salt of Vipers; the Doſe is from 6 to 15 Grains: Or the Fat of Vipers, from Half a Drachm to a Drachm, in ſome Conſerve of Roſes.

The Patient muſt afterwards be brought to a Salivation by Frictions, which muſt be made with Unguent of Mercury. This Unguent is compos'd of crude Mercury, mix'd with Turpentine in a Mortar; the whole being mix'd afterwards with Hog's Lard; *i. e.* one Part of Mercury upon three of Hog's Lard.

The Frictions begin at the Soal of the Foot; from thence they are continu'd to the Legs, and to the Inſide of the Thighs, taking Care not to touch the Back Bone. When the Patient is of a tender Conſtitution, ſometimes a ſingle Friction ſuffices. He muſt be rubb'd by the Fire, after he has took ſome Chicken Broth. He muſt not be rubb'd, each Time, with more than one or two Drachms of Mercury without reckoning the Greaſe. He is rubb'd with the Hand, ſo that no Greaſe appear on his Skin; after which, he muſt be put to Bed. The *Chirurgeon* muſt often look in the Mouth of the Patient, to ſee if the Mercury operates, which is eaſily known; becauſe the Tongue, Gums, and *Amigdalæ* ſwell, and grow thick; the Patient has the Head-ach, his Breath is ſtrong, his Face red, he has ſome Difficulty to ſwallow his Spittle, or begins to ſalivate.

If none of theſe Signs appear, he muſt again be rubb'd the next Day, Morning and Night; becauſe there are ſometimes four or five Frictions given, and internally ſome mercurial *Panacea*, to haſten the Salivation. During the Frictions, the Patient muſt be fed with Chicken-Broth, Eggs, *&c.* which he muſt take every two Hours, at leaſt. He muſt keep his Bed in a warm Room, and muſt not get up, but when the Salivation is to be ſtopp'd, which commonly laſts 20 or 25 Days, or rather till the Salivation be fine, *i. e.* no longer ſtinking, nor colour'd; but clear and fluid.

If a Looſeneſs happens during the Salivation, it ſtops; but it muſt be procur'd again, by ſtopping the Looſeneſs, with Clyſters made with Milk and Yolks of Eggs; and if it could not be procur'd that Way, a ſlight Friction muſt be made; if the Salivation was too copious, it muſt be diminiſh'd with ſome gentle Purgatives.

The Patient ſalivates, ordinarily, three or four Pounds every Day, in a Baſon made on Purpoſe; which he keeps in his Bed near his Mouth, into which the *Saliva* runs. A ſmall Stick, ty'd round with ſome linnen Cloth, muſt be thruſt, from Time to Time, between the Teeth and the Jaws, which otherwiſe would glue together.

If the Salivation does not ſtop of itſelf, in a due Time, to ſtop it, the Patient muſt be purg'd. If there are Ulcers left in his Mouth, they muſt be dry'd with Gargariſms made of Barley-water, Honey of Roſes, or warm'd Wine. Warts are cur'd with being ty'd, if the Ligature be poſſible; and if not, they muſt be conſum'd with Cauſticks. Sometimes they are cut, and left bleeding, and waſh'd afterwards with hot Wine.

When the Patient is up, he muſt be chang'd of Linnen, Bed, and Room, and purg'd; after which, he'll recover his Strength by being fed with good Aliments, and by drinking good Wine. If he be too much weaken'd, he muſt drink Cows Milk, with Sugar of Roſes.

It happens, ſometimes, ſays *Lemery*, that when the Patient has not been well prepar'd, and the Salivation has been excited too ſoon, the Sublimation been made with too great a Violence; Part of the Sublimy fixes itſelf on one or two Veſſels, corrodes their Membranes, and cauſes an Hæmorrhage; as he ſays he ſaw it happen to a Man in *Languedoc*, who in Half an Hour's Time vomited twelve Pounds of Blood without dying, becauſe he was a robuſt Man.

It happens, ſometimes, that the ſalivary Ducts, ſays the ſame Author, have been ſo much dilated and relax'd, by the pricking Salts which made the Sali-

Salivation, that they can never be contracted again; whence the Brain dries up by Degrees, and Death follows; therefore a *Chirurgeon* muſt take Care not to let the Salivation run too long.

If the *Pox* be not inveterate, the Salivation can be excited by the mercurial *Panacea* alone, without giving the Frictions; after Bleeding, the Purgations, and Bath, the Patient muſt take ten Grains of that *Panacea* in the Morning, and as much at Night; the third Day he muſt take twenty Grains in the Morning, and as many at Night. The Doſe muſt be thus increaſed till the Salivation happens copiouſly, which muſt be kept running, by giving every ſecond or third Day twelve Grains of *Panacea*; which muſt be continu'd till the Salivation be fine, and the Accidents vaniſh'd.

From the Maladies of the Fleſh, we'll proceed to thoſe of the *Bones*, which are five in Number, *viz.* the *Luxation*, *Fracture*, *Caries*, or *Ulcers*, the *Exoſtoſis*, and the *Nodus*.

Luxation, or *Diſlocation*, (from the *Latin*, *Luxare*, to looſen) is the ſlipping of the Head of a *Bone* from its proper Receptacle into another Place, whereby the natural Motion of the Joint is deſtroy'd.

Luxations are either violent, proceeding from ſome external Cauſe; as Falls, Strains, Blows, Leaps, Extenſions, *&c.* or gentle, ariſing from internal Cauſes; as a natural Laxity of the Ligaments, a Fluxion of Humours, or gradual Collection thereof between the Joints, *&c.*

Luxation properly has Place only among *Bones*, whoſe Structure determines them to a manifeſt Motion, as are all thoſe united by *Diarthroſis*; thoſe articulated by *Synarthroſis*, where there is no manifeſt Motion, are indeed ſubject to Fracture, Caries, Exoſtoſis, *&c.* but not to *Luxation*.

Luxations again are either complete, total, and perfect; or incomplete, partial, and imperfect. Both theſe *Luxations* can happen behind, or before, within Side, or without, and be ſimple or complicated.

Perfect, or *compleat Luxation*, is that where the Head of a *Bone* is actually ſtarted out of the Cavity of another. It is known by a Tumour or Protuberance, formed by the Head of the ſeparated *Bone*, which raiſes up the Skin, and muſcular Fleſh above its natural Level, in a Part not deſtined to receive it; and a Hollowneſs or ſinking in the Place from whence it is ſtarted, perceivable by the Touch. It is alſo attended with great Pain, a total Abolition of Motion, and a ſhortening of the Limb.

Imperfect or *partial Luxation*, called alſo *Subluxation*, is where the Motion is only much impaired, the Joint weakened, and a Deformity perceivable in it, when compared with the oppoſite Part, which is ſound. This is otherwiſe called a *Strain*, when it proceeds from an external Cauſe; or ſimply a *Relaxation*, when from an internal one.

A *Luxation* is ſaid to be *ſimple*, when it has no other Accident or Injury accompanying it. *Complicated*, when it is attended with a Wound, Inflammation, Fracture, or the like.

The Cure of a *ſimple Luxation*, is by a ſpeedy Reduction of the diſlocated Member to its natural Place. To this are neceſſary, 1. *Extenſion*, ανλιξασις, which a luxated as well as fractured Member requires; as well on Account of the Contraction of the Tendons, as that the Head of the Bone may more directly be introduced into its Seat.

This Extenſion is made either by the Hands alone, which is called *Modus palæſtrius*; becauſe among Wreſtlers, diſlocated Members uſed to be reduced after this Manner; or by Ligatures or Towels; or by Inſtruments or great Machines, when the Luxation is difficult and inveterate. 2. After *Extenſion* follows the intruding of the Joint into its natural Cavity; which likewiſe, may either be effected by the Hands only, or by the Heel (as when the Head of the *Os Humeri* is fallen into the Arm Pit) or by Means of Ladders, Doors, Peſtles, or *Hippocrates*'s Inſtrument, called *Ambe*. This Way is termed methodical, by Way of Diſtinction from the third, which is called *Organical*, becauſe performed by large Inſtruments, but now altogether out of Uſe. *Gourmelinus* to theſe adds αποθεσις, the very Act of reducing the Member into its own Place, which is to be known by the Sound uſually heard, and from the Uſe and Motion of the reduced Joint.

Laſtly, Becauſe on Account of the Laxity of the Tendons, *&c.* the reduced *Bone* cannot remain in its natural Poſition, it is neceſſary, yet further, to apply Compreſſes and Bandages; by which means the Articulation is preſerved ſafe, 'till the Ligaments may acquire their uſual Strength of Elaſticity and Aſtriction.

The Luxation of the Thigh with the Hip, is ſeldom or never reduced. That of the firſt *Vertebra* is very difficult. That of the inferior Jaw-bone, and of the Sole of the Foot is mortal.

The Reduction of *Luxations* is eaſier in Children than in aged Perſons, but it grows more difficult when deferred for ſeveral Days, becauſe of the Abundance of the *Lympha*, and of the nutritious Juice.

If an Inflammation ſhould happen before the Member is reduced, nothing ought to be attempted 'till that Inflammation is appeaſed, but in order to prevent and appeaſe it, the reduced Member muſt be bathed with hot Wine, in which have boiled the Summits of *St. John's Wort*, *Camomile*, *Roſmarin*, *Stæchas*, and the like. The Bands muſt be dipped in the ſame Liquor.

If an œdematous Tumour riſes on the luxated Member, after the Articulation has been reduced, Sudorificks muſt be adminiſtred to the Patient, and the Member anointed with Oil of *St. John's Wort*, or of *Turpentine*, and covered with a Plaiſter made of *yellow Wax*, and *white Reſin*; the whole being melted, there muſt be added to it *white Succin*, and *Gum Elemi*; of each a ſufficient Quantity to make a Maſs, which muſt be incorporated with the *Balſam* of *Peru*.

If the *Bone* be thrown out of its Place by a coagulated Matter, in Form of a Plaiſter; Reſolutives and Attenuants muſt be uſed, as are the Spirit volatile of *Tartar* prepared with the Lees of Wine, or the Spirit of *Tartar* prepared by Fermentation. With *Tartar* and its proper *Alkali*, which is the beſt, the Uſe thereof muſt be continued.

When the diſlocated Bone has not been reduced ſoon enough, there is formed in the Cavity a *Coagulum*, which hinders the Reduction; this *Coagulum* may be melted with the following Oils before the Reduction of the *Bone*. Take one Part of diſtill'd Oil of *human Bones*, two Parts of fetid Oil of *Tartar*; mix the whole together, and put *Quick Lime* over it, to have it diſtilled through a Retort; the Part muſt be fomented with this Oil.

If the Luxation has happened through a too great Relaxation of the Ligaments, they muſt be ſtrengthened by the Part reduced being kept in its Place by good Bandages, preſcribing all Remedies, impregnated with an oily volatile Salt, as thoſe produced by the *Saſſafras*, *Sarſaparilla*, *Sal-Armoniack*, &c.

Before I proceed further, I muſt give my Pupil ſome Examples of the moſt ordinary Luxations, as that of the *Wriſt*, of the *Leg*, of the *Rotula*, of the *Foot*, and of the *Jaw-Bones*.

The Wrist is luxated in two Manners, *viz.* according to its Flection or Extenſion; or according to the Abduction and Adduction. The Luxation according to its Flection is called inward, then the Hand is turned inwardly; the contrary happens when diſlocated according to its Extenſion, called the *outward Extenſion*.

The *Luxation* towards the Ribs, or according to Adduction, is when the *Wriſt* is preſſed towards the *Radius*, then there is a Tumour on that Side, and a Cavity on the other, and the Hand inclines towards the *Cubitus*.

The two laſt *Luxations* are imperfect, becauſe of the Apophiſes of the *Cubitus* and *Radius*.

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